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BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, D.C. 20268-0001

RATE ADJUSTMENT DUE TO EXTRAORDINARY OR EXCEPTIONAL CIRCUMSTANCES	)))	Docket No. R2013-11

INITIAL COMMENTS OF MPA—THE ASSOCIATION OF MAGAZINE MEDIA, ASSOCIATION FOR POSTAL COMMERCE, THE AMERICAN CATALOG MAILERS ASSOCIATION, INC., DIRECT MARKETING ASSOCIATION, INC., ALLIANCE OF NONPROFIT MAILERS, ASSOCIATION OF MARKETING SERVICE PROVIDERS, MAJOR MAILERS ASSOCIATION, NATIONAL NEWSPAPER ASSOCIATION, PRINTING INDUSTRIES OF AMERICA, QUAD/GRAPHICS, INC., R.R. DONNELLEY, SOFTWARE & INFORMATION INDUSTRY ASSOCIATION/ AMERICAN BUSINESS MEDIA, AND TIME INC.

(November 26, 2013)

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"When quantifying the net adverse financial impact of the exigent circumstances, the Postal Service must factor out the financial impact of non-exigent circumstances, such as the continuing effects of electronic diversion. This process ensures that an exigent rate adjustment is limited to the adverse effects of the exigent circumstances as opposed to other, non-exigent factors."

Order No. 864 in Docket No. R2010-4R (September 20, 2011) at 48.

"Electronic Diversion is the Primary Driver of First-Class Mail Volume Decline . . . The Economy is NOT the Main Cause of Diversion."

USPS Plan to Profitability: 5 Year Business Plan (February 16, 2012) at 5.

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(November 26, 2013)

The undersigned parties respectfully submit these comments on the Postal Service's September 26 request for above-CPI rate increases in rates on market-dominant mail products. These comments are supported by the attached statements of (1) Christian T. Lundblad, Edward M. O'Herron Distinguished Scholar and Professor of Finance at the Kenan-Flagler Business School of the University of North Carolina, and (2) Jon Swallen, Chief Research Officer of Kantar Media.

SUMMARY OF COMMENTS

The recession of 2007-2009 indisputably depressed mail volume. But so has electronic diversion, and to a far greater extent. This is particularly true in the last few years. The recession ended, and the recovery began, in 2009.

Since then, however, the Internet has continued to integrate itself even more deeply into the daily lives of Americans. The central question in this case is the extent to which the Postal Service's losses are due to the 2007-2009 recession rather than Internet diversion and other non-recession causes. The Postal Service claims that essentially all of its decline in mail volume from Fiscal Year 2007 to 2012 resulted from the former, and none from the latter. This extraordinary claim is implausible and, on closer inspection, unsupportable.

As the Commission recognized in Docket Nos. R2010-4 and R2010-4R, 39 U.S.C. § 3622(d)(1)(E) limits the Postal Service to recovery of losses that (1) must be recouped to continue providing mail service, and (2) were "due to" (i.e., caused by) the 2007-2009 recession. The Postal Service bears the burden of proof on these requirements. This burden is compounded by the overwhelming consensus of most observers—and repeated admissions by the Postal Service itself—that the main driver of the decline in mail volume since 2007 has been the long-term trend of electronic diversion, not the 2007-2009 recession.

The Postal Service has tried to meet its burden of proof in this case through a time-series analysis sponsored by USPS witness Thress. Mr. Thress's analysis purportedly shows that essentially the *entire* net decline in volume—25.6 percent—between Fiscal Years 2007 and 2012 was caused by the 2007-2009 recession. These claims are implausible on their face. First, the percentage decline in mail volume that Mr. Thress attributes to the recession is several times deeper than the percentage decline in the overall economy during the recession. Second, the overall recession bottomed out in 2009, and the economy has been

recovering since then. By contrast, Mr. Thress's approach attributes to the recession a continued deepening of losses into the future, indefinitely. Third, the losses that Mr. Thress's analysis attributes to the recession are several times larger than the downturns in volume attributed to the recession by risk exposure analysis, a standard method that business enterprises use to estimate the sensitivity of changes in their sales volume to changes in macroeconomic conditions.

Review of Mr. Thress's methodology confirms that his loss claims are in fact grossly inflated by flaws in his methodology. The biggest error involves not the design of his regression model, but his interpretation of its results. The vast majority of the volume losses that Mr. Thress attributes to the recession are in fact associated with "trend" and "intervention" variables, not standard cyclical macroeconomic variables. Mr. Thress asserts that trends which began or accelerated around the time of the recession were caused by the recession. This assertion is unsupported by Mr. Thress's time-series analysis, and all evidence indicates that the variables were actually capturing electronic substitution.

Mr. Thress's model further inflates the losses attributable to the 2007-2009 recession by excluding the positive macroeconomic effects of the post-recession recovery that has been under way since 2009. The model is also tainted by Mr. Thress's failure to use appropriate statistical tests to validate his *ad hoc* choice of trend start dates, functional forms, and optimization procedures, and by his failure to deal appropriately with the non-stationarity of the data.

Mr. Thress's time series analysis can be modified to provide a more realistic estimate of the losses actually incurred by the Postal Service as a result of the recession. This can be done by (1) eliminating his arbitrary interpretation of many of the time trend variables in his equations as recession-related; (2) including the positive effects of the economic recovery as well as the negative effects of the downturn in calculating the overall effect of the recession; and (3) excluding the trend component of macroeconomic variables from the effect of the recession. This restated analysis shows that the Postal Service's mail volume losses actually due to the recession were only about 3.7 percent in FY 2012. The projected losses in FY 2013 and FY 2014 are only 3.1 percent and 2.4 percent, respectively. These figures equate to recession-related losses in contribution of about $488 million in FY 2012, $401 million (projected) in FY 2013, and $301 million (projected) in FY 2014. These are a fraction of the annual losses that the Postal Service attributes to the recession.

Finally, the Postal Service would compound its inflated loss estimates by having the resulting rate increase remain in effect indefinitely and be incorporated into the base rates for future increases. This would lead to massive and unlawful overrecovery. Section 3622(d)(1)(E) allows the Postal Service to recover losses only to the extent that they were caused by the 2007-2009 recession or another exigent circumstance. The volume losses attributable to the 2007-2009 recession are diminishing rapidly with each passing year; hence, embedding an exigent rate surcharge indefinitely in the Postal Service's rates would guarantee the recovery over time of far more than the Postal Service's actual recession-related losses. Moreover, ample time has passed for the Postal

Service to adapt to the reduced volume it can reasonably expect in a world of electronic communications.

Furthermore, excess recovery of prospective recession-related losses cannot be justified as deferred compensation for past recession-related losses incurred. 39 U.S.C. § 3622(d)(1)(E) allows recoupment of recession-related costs only to the extent "necessary" for the Postal Service to continue providing service. Recovery of the Postal Service's past losses is not necessary in that sense. The Postal Service, forced by the CPI cap to economize, downsized and cut costs. Congress provided relief by allowing the Postal Service to forego or defer several years of annual contributions to the Retiree Health Benefit Fund. The Postal Service continued to operate, meet payroll, and provide mail service.

For these reasons, the Commission should require that any exigent rate increase approved in this case be rescinded on January 26, 2016, or 24 months after it takes effect. The amount of the increase should be limited so that the Postal Service does not recover more than the projected losses in contribution caused by the 2007-2009 recession during the two-year period between January 26, 2014, and January 26, 2016. A reasonable (if generous) estimate of those losses can be derived from Professor Lundblad's projections of the Postal Service's recession-related losses in Fiscal Years 2013 and 2014: $401 million in FY 2013 and $301 million in FY 2014. The average of those two figures is $351 million per year. That should be the upper bound on the extra contribution that the Postal Service is allowed to recover during each of two years between January 2014 and January 2016. By the end of that period, the end of the 2007-

2009 recession will be nearly seven years in the past. Seven years are more than ample for the Postal Service to adapt, as its customers have, to the new normal.

COMMENTS

I. THE POSTAL SERVICE'S CLAIM THAT NEARLY ALL OF ITS POST-2007 VOLUME LOSSES WERE DUE TO THE 2007-2009 RECESSION IS REFUTED BY OVERWHELMING EVIDENCE THAT ELECTRONIC DIVERSION AND OTHER LONG-TERM TRENDS WERE THE PRIMARY CAUSE OF THE DECLINE IN VOLUME.

A. Introduction

The "due to" requirement of 39 U.S.C. § 3622(d) limits the Postal Service's recovery to losses that were caused by the "extraordinary or exceptional" circumstances identified by the USPS, rather than by longer-run secular trends such as electronic diversion. Accordingly, the USPS bears the burden of proving that the added contribution from the above-CPI rate increases that the USPS seeks in Docket No. R2013-11 does not exceed the FY 2012 losses that were *caused by the 2007-2009 recession*:

> When quantifying the net adverse financial impact of the exigent circumstances, the Postal Service must factor out the financial impact of non-exigent circumstances, such as the continuing effects of electronic diversion. This process ensures that an exigent rate adjustment is limited to the adverse effects of the exigent circumstances as opposed to other, non-exigent factors.

Docket No. R2010-4R, Order No. 864 (September 20, 2011) at 48-51; *accord*, Order No. 1059 (December 20, 2011) at 6-7; Docket No. R2010-4, Order No. 547 (September 30, 2010) at 53-61.

The burden of proof on this issue rests with the Postal Service, the party that is seeking to change the status quo. 5 U.S.C. § 556(d) (first sentence); Order No. 1059 at 6-7; Order No. 864 at 45 ("exigent rate adjustments must be causally linked to the *net* financial impact of the exigent circumstances rather than the amount of the revenue lost") (emphasis in original); *id*. at 46-52 (the Postal Service must "[q]uantify the net adverse financial impact of the exigent circumstances" and "[d]emonstrate that the amount of the proposed adjustment does not exceed the net financial impact of the exigent circumstances"); Order No. 547 at 2-4.

In deciding whether the Postal Service has met this burden of proof in this case, the Commission is not writing on a blank slate. The effects of both electronic diversion and the 2007-2009 recession have been subjects of intense study and analysis for years. The overwhelming consensus of informed observers—not the least the Postal Service itself—is that the main driver of the decline in mail volume between 2007 and 2012 was *not* the 2007-2009 recession, but the ***long-term trend of electronic diversion***. The following statements—most of them from the USPS itself—are just a few of the many one could quote:

Statements and Reports of the USPS

"First-Class Mail volume has been ***in decline since its peak in 2001***, ***primarily due to diversion of correspondence to electronic alternatives*** (email, electronic bill payment, direct deposit, on-line banking, etc.)." Statement of USPS witness Stephen J. Masse in Docket No. R2010-4 (July 6, 2010) at 5, lines 6-8 (emphasis added).

"***Electronic Diversion is the Primary Driver of First-Class Mail Volume Decline . . . . The Economy is NOT the Main Cause of Diversion.***" USPS Plan to Profitability: 5 Year Business Plan (February 16, 2012) at 5 (emphasis added).

"Our business and results of operations are adversely affected by electronic diversion. If we do not compete effectively with electronic communications services, or alternatively grow marketing mail and package services, or increase revenue and profit margins from other sources, this adverse impact will become more substantial over time. . . . Customer usage of postal services continues to shift away from transactions, correspondence, and Periodicals Mail toward advertising and Shipping Services. Advertising and Shipping Services are highly correlated with economic activity. Over the past five years, transactional mail, such as the presentment and payment of bills, has been sharply eroded by competition from electronic media, driven by some of our major mailers who actively promote the use of online services. Factors underlying this trend include growing Internet access in homes, increased availability of broadband service, expansion of mobile Internet access, increasing

familiarity and comfort with the Internet, and the growing trend by business to incent or require their customers to use alternatives to mail for payments and statement presentment." USPS Form 10-K for FY 2012 (November 2012) at 12.

"To date, consumer spending and business investment since the end of the recession have not provided the growth stimulus necessary to boost mail volumes. ***Due to the long-term impact of technological change***, discussed above, we do not anticipate volume ever returning to the levels which we experienced in the mid-2000s. In fact, we anticipate that mail volume will, for the most part, continue to decrease for the foreseeable future." USPS Form 10-K for FY 2012 (November 2012) at 25-26 (emphasis added).

"The requirement of the Postal Accountability and Enhancement Act, Public Law 109-435 (P.L. 109-435) to prefund its retiree health benefit obligations, a requirement not imposed upon other federal agencies or private sector businesses, plus ***the drop in mail volume and changes in the mail mix caused by changes in consumers' use of mail***, have been ***the major factors contributing to Postal Service losses since the recession ended in 2009***. Without structural change to the business model, the Postal Service will continue to be negatively impacted by these factors and, absent legislative change, it anticipates continuing quarterly losses into the foreseeable future." USPS Form 10Q for 3rd Quarter FY 2012 (August 9, 2013) at 8 (emphasis added); *id*. at 41 (same); accord, USPS Form 10Q for 2nd Quarter 2013 at 7 & 39 (same).

USPS Office of Inspector General

"**The Great Diversion.** The Postal Service's financial dependence on First-Class Mail has been precarious ***for the last 16 years***, as the expanded use of the Internet has made First-Class Mail less relevant to mailers. Figure 4 summarizes the diversion story succinctly . . . The economy, as measured by real Gross Domestic Product, grew at a steady pace through most of the last four decades. For the first half of this period, First-Class Mail volume grew at nearly the same pace as the economy. Then, in the mid-1990s, something clearly changed. Once the province of hobbyists and academics, the Internet became widely available to households and businesses. Slow dial up services gave way to high speed broadband connections. Paid electronic billing services transformed into free bill pay service on every major bank's website. Although broadband penetration has slowed in recent years, there are many reasons to believe that access to and use of the Internet will continue to grow. For example, mobile Internet access via smart phones continues to rapidly increase. Incremental expansion of broadband access to low income households continues to attract the attention of policy makers. First-Class Mail volume growth slowed relative to the economy. The effect of electronic diversion was first felt by single-piece First Class Mail, but, in the early 2000s, it spread to bulk (i.e., workshared) First-Class Mail. At this point, First-Class Mail volume actually began to decline. But for a brief plateau in the mid-2000s it has shown no signs of positive growth." USPS OIG Report No. RARC-WP-12-010, *State of the Mail* (April 27, 2012) at 7-8.

"Although correspondence and transactions mail and Periodicals are valued by postal customers, they are losing ground to formidable challenges in the marketplace. ***Electronic diversion and long-term secular downward trends continue to eat away at these segments*** which account for 34 percent of total volume, 35 percent of total revenue, and 41 percent of total contribution." USPS OIG Report No. RARC-WP-12-010, *State of the Mail* (April 27, 2012) at I (emphasis added).

"A careful analysis of the Internet's effect on the demand for mail indicates that volume is shifting to the Internet ***because it is a cost effective substitute***. USPS OIG Report No. RARC-WP-12-010, *State of the Mail* (April 27, 2012) at ii (emphasis added).

"Electronic substitution of traditional mail is accelerating, as consumers and businesses increasingly rely on new technologies. The result has been considerable mail volume and revenue decline for the USPS." USPS OIG, *What America Wants from the Postal Service* (May 2013) at 10.

Reports of USPS Consultants

"These declining volumes are unlikely to reverse. First-Class Mail is succumbing to the online diversion of bills, invoices, statements, and payments. Senders are aggressively attacking the cost of paper transactions – both for sending mail and processing responses. More consumers will move online when key barriers, like security concerns, are removed. Senders hear these concerns and are actively addressing them. Standard Mail, largely ad driven, will benefit

from high marketing ROI relative to broadcast and newsprint. Yet Standard Mail will also lose share to, e.g., context-based search ads and mobile ads. ***What the U.S. is experiencing is not unique: many internet-enabled countries in Europe and Asia have been experiencing declines in mail volumes for years due to online alternatives***." The Boston Consulting Group, Inc., *Projecting U.S. Mail Volumes to 2020* (March 2, 2010) (report commissioned by USPS) at page 2 (emphasis added).

"In the longer term, Senders are eager to be first to market with new technologies that will potentially differentiate themselves in the eyes of lucrative, tech-savvy consumers. Mobile will emerge as a key platform in the next decade—and one that also eliminates mail. Banks see consumer appetite for instant statements of account balances, and they are testing mobile solutions now; mobile will eventually break the 30-day statement paradigm. We see mobile as a lesser threat to mail than online channels in the next decade, but these will also contribute to erosion of key segments of mail." Boston Consulting Group report, *supra*, at 9.

"Thus a sustained period of unusually high economic growth is insufficient to lift total mail volumes 10% above the current projection—and certainly not enough to offset the economic losses driven sustained long-term declines and a shift from First-Class Mail. In addition, household broadband penetration in 2020 is projected to be 85%, and this impacts online diversion, particularly for First-Class Mail." Boston Consulting Group report, *supra*, at 10.

GAO Reports

"First-Class Mail and Standard Mail also face competition from electronic alternatives, as many businesses and consumers have moved to electronic payments over the past decade in lieu of using the mail to pay bills. For the first time, in 2010, fewer than 50 percent of all bills were paid by mail." U.S. General Accountability Office ("GAO") report GAO-13-562T, *U.S. Postal Service: Urgent Action Needed to Achieve Financial Sustainability* (April 17, 2013) at page 3.

"USPS expects mail volume and revenue to continue decreasing as online bill communication and e-commerce expand." *Id*. at ii.

PRC Staff

"Our results provide a quantitative picture of the impact of the Internet on USPS volumes. The impact is severe by any standard. Back casts with our econometric model show that, absent the Internet, in 2012 Q3 First-Class Single-piece letter volume would have been 37.6 percent higher; First-Class workshared letter volume 21.0 percent higher; Periodicals Outside County 27.3 percent higher; Standard Regular Non-Carrier Route mail 6.0 percent higher, Standard Regular Carrier Route 35.4 percent higher, and Priority Mail 44.3 percent higher." Margaret M. Cigno, Katalin K. Clendenin and Edward S. Pearsall, "Are U.S. Postal Price Elasticities Changing?" (presented at the 21st Conference on Postal and Delivery Economics, Center for Research in Regulated Industries (CRRI), Portmarnock, Ireland, May 29 – June 1, 2013) at 3.

* * *

Given this consensus about electronic diversion, the Commission should view with extreme skepticism any claim that recent and future declines in mail volume are, or will be, due mainly to the 2007-2009 recession. And the Postal Service's extraordinary claim that essentially *all* of its volume loss after 2007 resulted (and will result) from the recession should require extraordinary proof. As we demonstrate in this section, the Postal Service's claim of causation fails even the most minimal standard of proof.

A. Description of the Thress Time Series Analysis

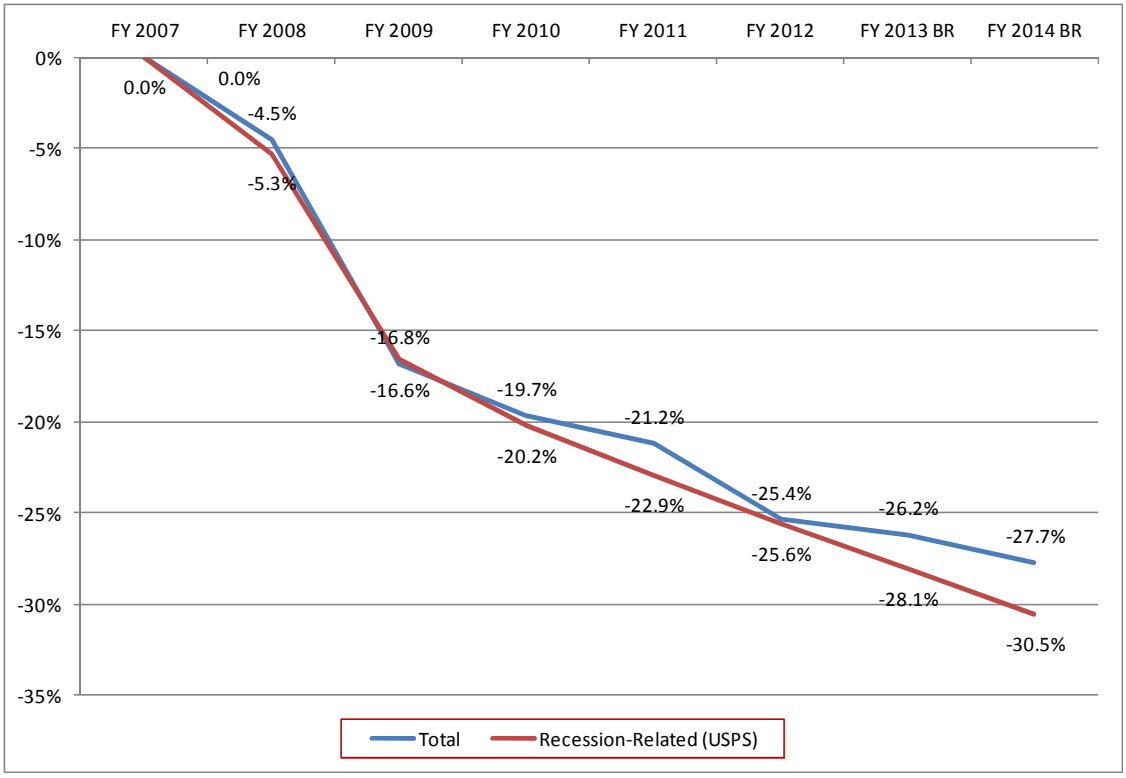
The Postal Service has tried to establish a causal link between the 2007-2009 recession and the need for above-CPI rate increases with a time-series analysis sponsored by USPS witness Thress. Mr. Thress's analysis regresses quarterly mail volumes against a variety of purported causal variables. Relying on this analysis, Mr. Thress contends that:

- The 2007-2009 recession caused a 20 percent decline in mail volume between 2007 and 2010.

- The percentage volume losses caused by the 2007-2009 recession *continued to grow after FY 2010, and will continue to grow in FY 2013 and FY 2014.*

- Essentially *all* of the 25.6 percent net decline in mail volume from 2007 to 2012 was caused by the 2007-2009 recession:

Cumulative Percentage Decline in Market Dominant Mail Volume From FY 2007

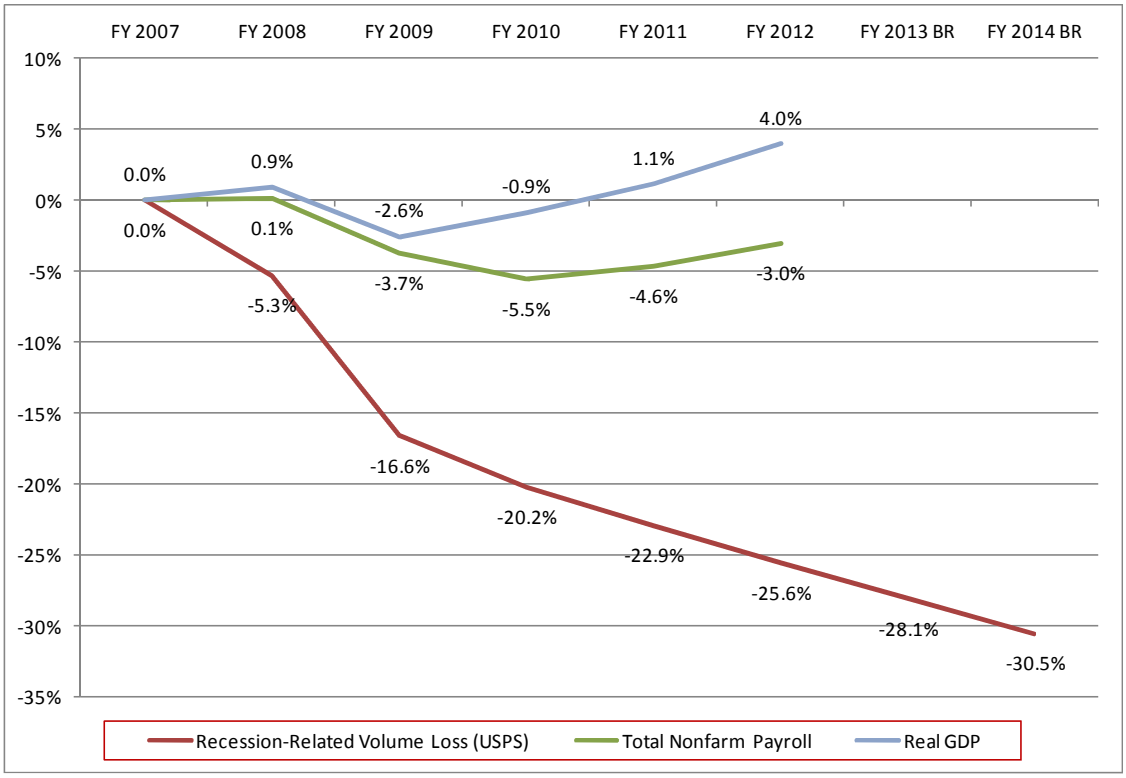


Lundblad Statement at 6-7; Library Reference MPA et al.-LR-R2013-11/2, LR-2.xlsx, "Figures".

Another USPS declarant, Stephen Nickerson, has translated the 25.6 percent decline in volume for FY 2012 into an estimated $6.6 billion in lost contribution in the same year. Nickerson Statement (Sept. 26, 2013) at 4-5 & n. 2.

B. The Losses Estimated By Mr. Thress Are Counterintuitive And Implausible.

The results of the Postal Service's causation analysis are counterintuitive in several respects. First, the ***magnitude*** of the volume losses that Mr. Thress attributes to the recession dwarf the percentage changes in standard macroeconomic variables:

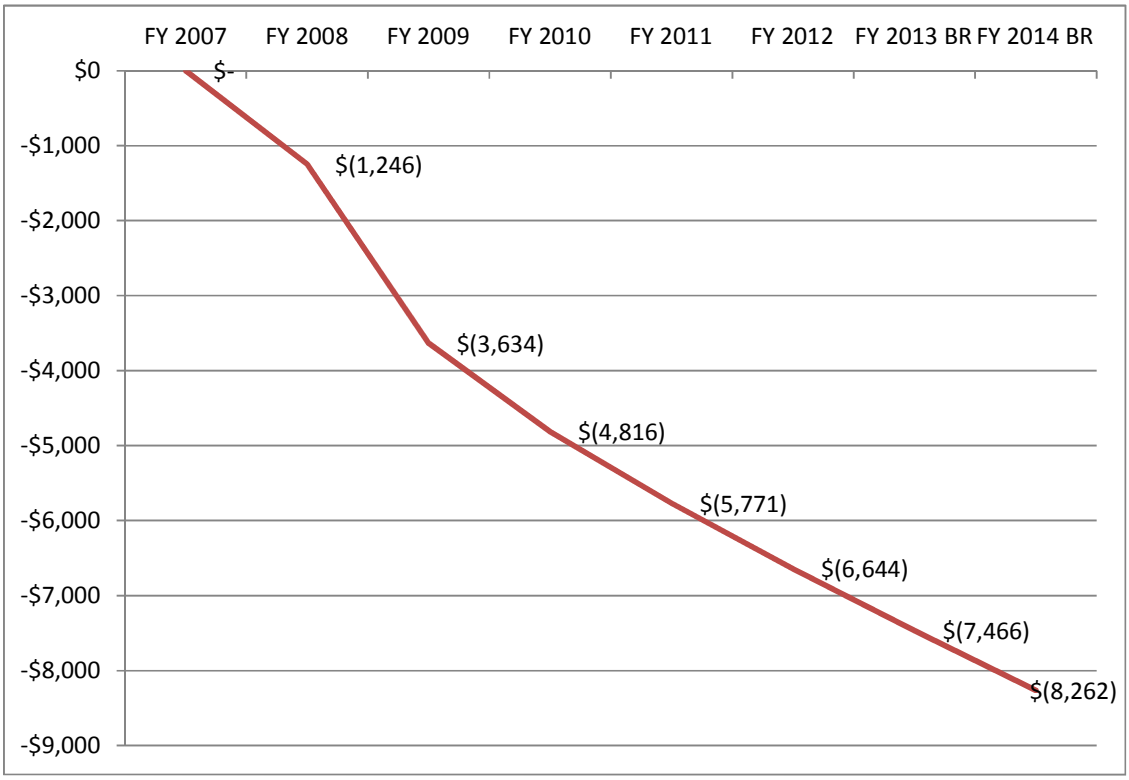


Lundblad Statement at 7-8; Library Reference MPA *et al*.-LR-R2013-11/2, LR-2.xlsx, "Figures".

Second, the ***shape*** or ***time path*** of the Postal Service's estimates of the impact of the 2007-2009 recession on mail volumes is also anomalous. As the figure above shows, the effect of the recession on real GDP and employment bottomed out in FY 2009 and FY 2010, respectively, and has largely recovered

since then. Indeed, inflation-adjusted GDP was higher in FY 2012 than in FY 2007. However, the annual volume and contribution losses attributed by the Postal Service to the recession have grown *deeper* every succeeding year even as the economy has recovered. Indeed, Mr. Thress's methodology projects that the impact of the 2007-2009 recession on mail volume and contribution will *continue* to deepen in FY 2013 and FY 2014. Thress Response to POIR 1, Question 6; Thress response to POIR 6, Question 14. The following figure shows this graphically:

CONTRIBUTION LOSSES ATTRIBUTED BY USPS TO THE 2007-2009 RECESSION



Source: Library Reference MPA *et al*.-LR-R2013-11/1.

Recessions do not behave this way. The following table shows the changes in mail volume during the two years before and after each of the last several recessions. As the table illustrates, the irreversible one-way decline depicted by Mr. Thress did not occur after any of these recessions (Lundblad Statement at 9):

Two-Year Percent Change in Volume Before and After Recessions

Recession	Before	After
Nov 1973 - Mar 1975	3.8%	9.2%
Jan 1980 - Jul 1980 & Jul 1981 - Nov 1982*	9.8%	12.1%
Jul 1990 - Mar 1991	7.5%	6.8%
Mar 2001 - Nov 2002	6.0%	3.3%

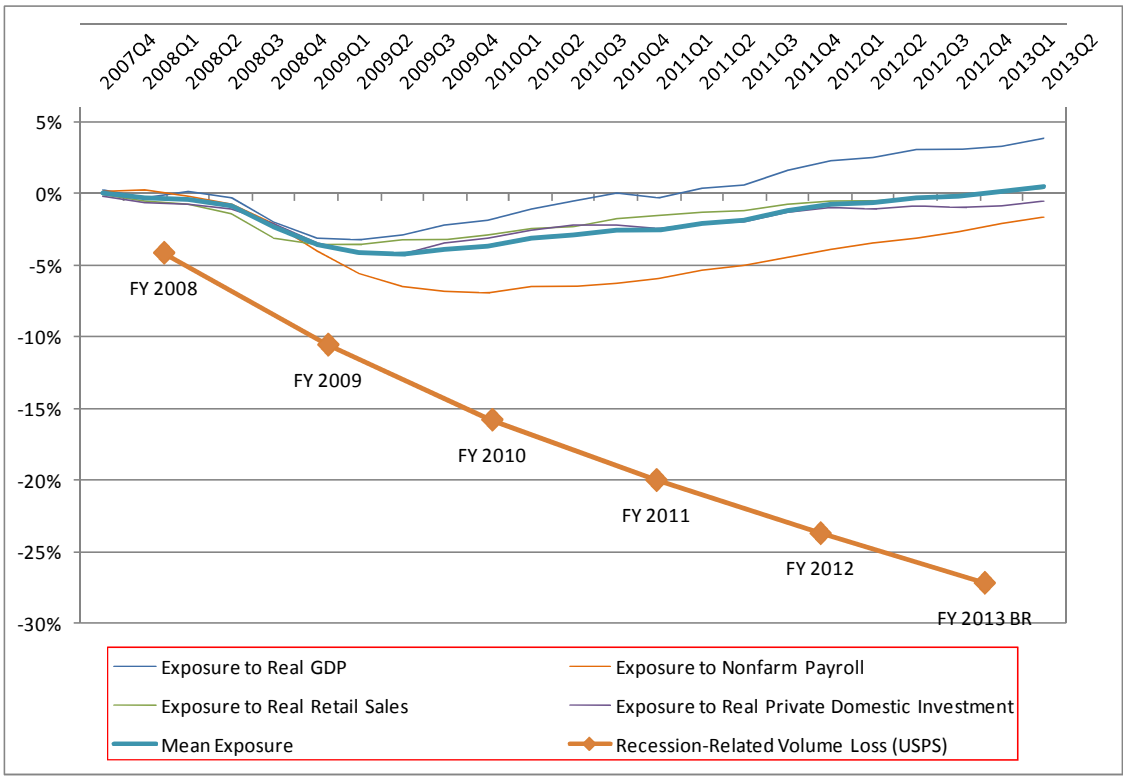
* Combined in table because of closeness in time.

While the 2007-2009 recession was more severe than these previous recessions, the overall shape has been the same: a downturn, a trough, and then a recovery. One would therefore expect the same pattern of recovery in mail volumes if the volume loss were due primarily to the recession. That mail volume has not tracked the recovery in GDP this time strongly suggests that factors other than the 2007-2009 recession are responsible for much of the volume loss.

Third, the Postal Service's loss claims fail the reality check provided by risk exposure analysis, a standard method used by corporations to gauge the likely effect on their revenue and profits from downturns in the macro economy.

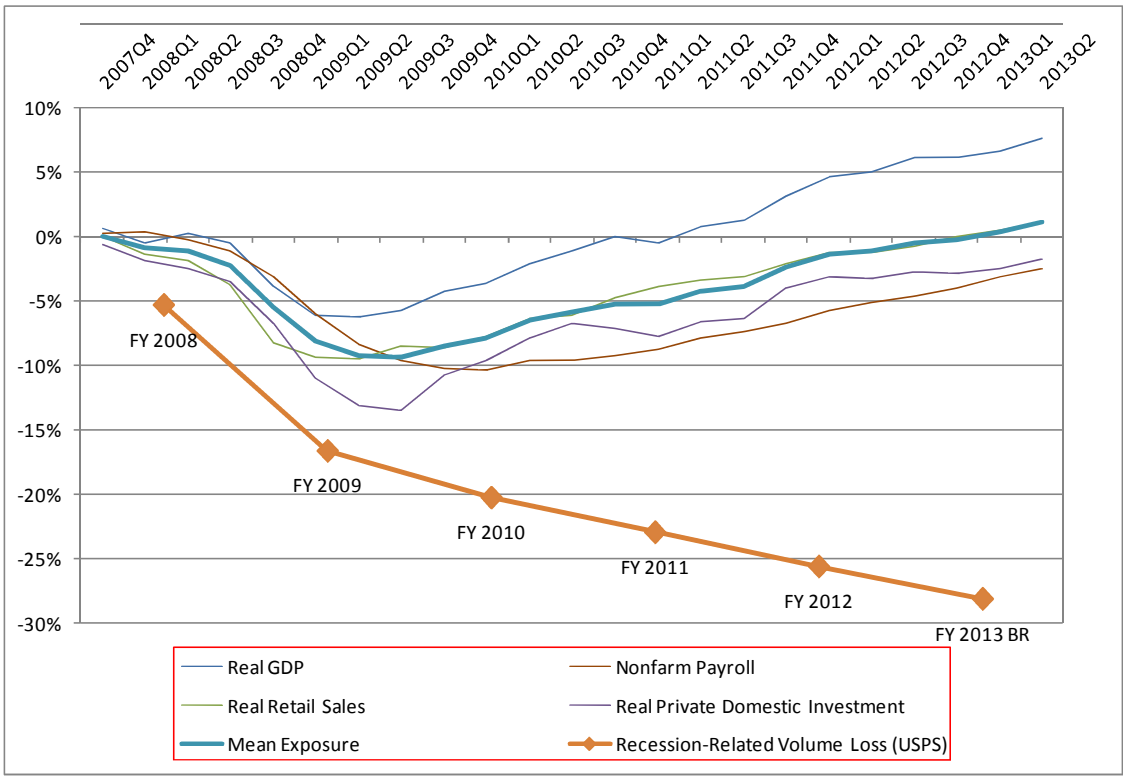
Risk exposure analysis is commonly performed by conducting simple regressions of the year-over-year or month-over-month *percentage change* in sales volume vs. the *percentage change* in macro variables such as real GDP, non-farm payroll employment, real retail sales, and real private domestic investment. Lundblad Statement at 32-37. A risk exposure analysis of this kind, when performed for the Postal Service for the years beginning in FY 2007, reveals a reality far different than the portrait drawn by the Thress analysis. The risk exposure analysis shows that, while the downturn in the macro variables during the recession did have an impact of the Postal Service, the effect was much milder than the Postal Service asserts, and the curves bottomed out in FYs 2009 and 2010 and effectively recovered by FY 2012.

The following graph compares the Postal Service's estimate of recession-related volume losses for First-Class Mail (the progressively declining orange line) with the cumulative effect of the recession on First-Class Mail volume for four different macroeconomic variables, as estimated by Professor Lundblad's risk exposure analysis:



Lundblad Statement at 35-36; Library Reference MPA et al.-LR-R2013-11/3, LR-3.xlsx, "Figures".

Here is the same comparison of recession-related volume losses for Standard Mail:



Lundblad Statement at 37; Library Reference MPA et al.-LR-R2013-11/3, LR-3.xlsx, "Figures". Neither comparison supports the existence of the dramatic, irreversible, one-way decline that the Thress analysis attributes to the recession.

C. The Thress Time Series Analysis Suffers From Methodological Flaws That Grossly Inflate The Volume Losses Attributed to The 2007-2009 Recession.

The implausibly large volume losses that Mr. Thress's methodology attributes to the 2007-2009 recession are not an accident, but the result of a series of methodological choices that systematically overstate the effect of the recession.

1. Mr. Thress has arbitrarily assumed that the volume losses associated with several trend variables were recession-related.

The single biggest reason for the exaggerated volume losses attributed by the Thress analysis to the recession is his handling and interpretation of several "trend" and "intervention" variables in his model—and, in particular, his unjustified interpretation of several of these variables as entirely recession-related.

A brief explanation of time series analysis should make this clear. A *time series* is a sequence of observations arranged according to the time of their outcome. *Time series analyses* are methods for analyzing time series data to extract their underlying causes.[1] As Mr. Thress and others have noted, these analyses are commonly performed by regressions that seek to find statistical correlations between the dependent variables (here, mail volumes for particular classes of mail) and a variety of explanatory, or independent variables. For time series analyses of mail volume, explanatory variables may include the U.S. population, the price of postage, the prices of competitors' services, the rate of inflation, the season of the year, and measures of the overall state of the macroeconomy (e.g., the GDP, employment, investment, retail sales, and foreign trade), as well as other possible explanatory variables. Thress Statement, Technical Appendix II.

[1] Chair of Statistics, University of Würzburg, *A First Course on Time Series Analysis* 1 (August 1, 2012) (available at http://statistik.mathematik.uni-wuerzburg.de/timeseries/).

The goal of time series analysis is to devise a combination of explanatory variables that (1) make real-world economic sense, and (2) "fit" the dependent variables well (i.e., that minimize the mean square error of the individual data points from the curves fitted by the model to the data).[2] Sometimes a time series model can be developed with traditional variables that satisfies both of these goals. Sometimes, however, the analyst cannot identify a combination of variables and functional forms that have both economic meaning and a tight fit with the data. In that event, analysts often add "trend" or "intervention" variables to the formula. Trend or intervention variables of this kind can tighten the statistical fit of a time series analysis.[3]

It is critical to understand, however, that trend and intervention variables have no intrinsic economic meaning: as measures of economic reality, they are shadows on the wall of Plato's cave. The underlying causes of these variables *must be inferred by the analyst from information outside the regression analysis itself.* Mr. Thress acknowledged this repeatedly during his cross-examination:

> [A] trend variable is going to pick up anything that trends. It's going to pick up macroeconomic trends, demographic trends, diversion

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[2] To illustrate the latter requirement, a time series analysis that showed a correlation between the Dow Jones Industrial Average and sunspot cycles or the number of points scored by the Green Bay Packers in the same year would not be regarded as reliable, even if the dependent variable fit tightly with the explanatory variables.

[3] See Thress Response to POIR 3, Question 7 ("Intervention variables and linear time trends are frequently investigated to explain changes in mail volumes that cannot be explained by more traditional variables (e.g., macro-economic variables, prices).").

> trends. And so it becomes difficult to pull out and say this trend was because of this one specific factor . . .
>
> * * *
>
> I mean econometric equations aren't as smart sometimes as I like to talk about them being, you know? The model doesn't know why volume is changing, it merely knows that volume is changing, and it knows that the variables you've included in the equation are changing.
>
> * * *
>
> In terms of what caused those diversions, why did the diversions change at that time, that's a question that requires one to -- I've said in several responses -- I think step outside of the econometric model.
>
> * * *
>
> Again, the econometric equation doesn't know that . . . this variable is measuring employment. The econometric variable knows that this is measuring a variable that has a volume of 110 this year and 109 last year and 114 five years ago. That's all the econometric model knows.

Tr. 1/90-91, 100, 113, 152 (Thress); *accord*, *id*. at 115, lines 12-15 (Thress); Thress Response to POIR No. 3, Question 1 ("to understand why these trends have changed requires moving outside of the econometric models and analyzing the underlying factors that are driving these trends"); Lundblad Statement at 10.

The Postal Service's modeling of electronic diversion and the recession exemplifies this problem. When the Postal Service began modeling the effects of electronic diversion in demand models about a decade ago, Mr. Thress and his colleagues first tried to capture the effects of electronic diversion by including explicit measures of Internet usage as explanatory variables in some of the

demand equations. USPS Narrative Explanation of Econometric Demand Equations for Market Dominant Products (filed with the PRC on January 22, 2013), at 14; Tr. 1/88 (Thress). As electronic diversion continued, however—in the Postal Service's terms, moving from breadth of usage to depth of usage—the Internet-related measures became inadequate to explain the effects, and the Postal Service replaced these explicit diversion variables with time trend variables to model the effects of electronic diversion on mail volume:

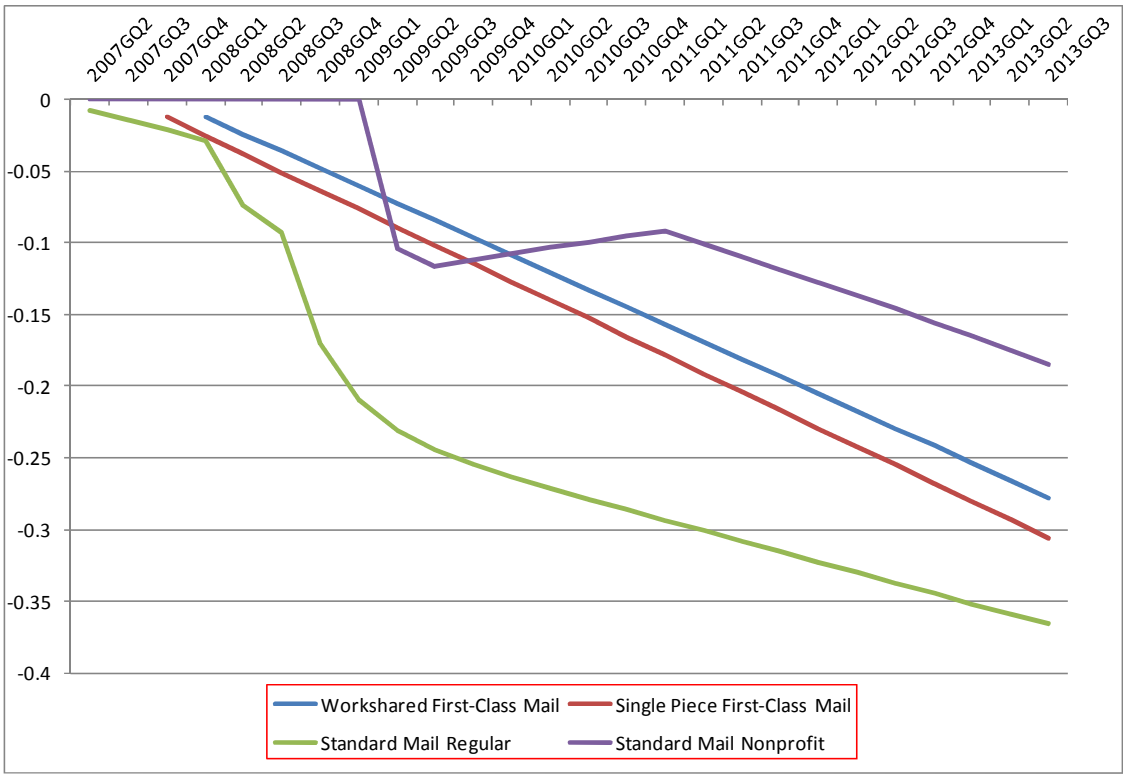
> For the demand equations for domestic mail, diversion is no longer modeled via explicit Internet variables, but, instead, is measured through a series of simple linear time trends which start at various times within the sample periods over which the Postal Service's demand equations are estimated.

USPS Narrative Explanation of Econometric Demand Equations, *supra*, at 15; Tr. 1/89 (Thress). In the absence of a good direct measure of the effects of electronic diversion, the use of trend variables was not an unreasonable approach. Lundblad Statement at 20-21; *accord*, Marzena Jarosik *et al*., "Letter traffic demand in the UK: some new evidence and review of econometric analysis over the past decade," in M. Crew and P. Kleindorfer, eds., *Reforming the Postal Sector in the Face of Electronic Competition* (2013) at 203.

For the present case, however, Mr. Thress has jettisoned this approach, arbitrarily reinterpreting all of the trend and intervention variables beginning around the time of the recession as related to the recession rather than the deepening of electronic diversion. If a trend appeared or changed course after 2007, Mr. Thress stuffed it into the recession box. Thress Response to POIR 1, Question 4.c, and POIR 3, Questions 1 and 5; Tr. 1/112-113 (Thress). The trend

and diversion variables that Mr. Thress arbitrarily classified in this way as recession-related account for more than *two-thirds* of the volume losses that he attributes to the 2007-2009 recession for FY 2012. Thress Response to POIR 3, Question 5.

The following graph illustrates the absurdity of this result. The graph shows the time trend variables for First-Class Workshared, First-Class Single Piece, Standard Mail Regular, and Standard Mail Nonprofit that the Postal Service attributes to the recession:



Lundblad Statement at 22; Library Reference MPA *et al*.-LR-R2013-11/2, LR-2.xlsx, "Figures". The Postal Service interprets these downward trends—

including even the portions occurring after mid-2009, when the recession ended and the recovery began—as due *entirely to the recession. Id*.

The Postal Service's reinterpretation of these trend and intervention variables as recession-related is indefensible. First, it is unsupported by the time-series analysis itself. As explained above, the time series analysis merely attributes volume changes to the trend variables; the model does not, and cannot, identify the cause(s) of the trends. That step depends on the judgment of the analyst. *See* pp. 23-24, *supra*.

Second, Mr. Thress's reinterpretation of the trend variables as recession related is poor modeling practice. Trend variables, as the name indicates, are properly used to model trends. Cyclical events should be modeled by cyclical variables. Using trend variables to model recessions, which are cyclical events, is a misuse of trend variables. Lundblad Statement at 9. Indeed, one of the most obvious absurdities produced by the Postal Service's result-oriented reinterpretation of the trend variables is that the Thress model no longer has any variable that could explain a secular upsurge in electronic diversion. The current version of the USPS/Thress time series model *effectively writes changes in the rate of electronic diversion out of the model.* Lundblad Statement at 20-22; Tr. 122, lines 15-21 (Thress).

Third, Mr. Thress's failure to include additional explanatory variables that explicitly model other indicators of the business cycle is powerful evidence that the volume decline was not primarily recession-related. If the recession were really the main cause of the decline in mail volume since 2007, one would expect

that he could have improved the explanatory power of his model by adding *cyclical* explanatory variables for some of the supposed manifestations of the recession that he recited during the November 19 hearing (e.g., changes in "real median household income," "the rate of household formation," the number of "credit card accounts" and "mortgage loan accounts," the rate of home ownership, and "gross private domestic investment"). Tr. 1/101-102, 114, 117 (Thress). The Commission can reasonably infer from the absence of these variables in Mr. Thress's model as filed that he tested them and discovered that they did not improve its explanatory power. *See* Thress Response to POIR 8, Question 1 (boasting of the continual testing and "literally thousands of econometric experiments that have been conducted by me and others over at least the last three years"). The absence from his time series models of any other explanatory variables that explicitly capture macroeconomic events is the dog that did not bark.

Finally, and most important, the extrinsic evidence shows that the trend variables overwhelmingly reflect the acceleration of Internet diversion since 2007, not the effects of the 2007-2009 recession. This is not a novel observation. As noted above, this has been the consensus of informed observers for several years, and the Postal Service has admitted repeatedly that it is correct. *See* pp. 7-13, *supra*.

Since the filing of the Postal Service's request on September 26, Mr. Thress has offered essentially five defenses for his idiosyncratic new interpretation of the trend and intervention variables:

(1) Electronic diversion existed before 2007, but the decline in mail volume accelerated in 2008, and the growth in subscriptions to Internet access has leveled off, so the accelerated volume loss must have been caused by something *other than* electronic diversion. The only possible other cause is the recession.

(2) The post-2007 acceleration in electronic diversion was itself caused by the recession.

(3) Total spending on advertising of all kinds, not just advertising mail, has fallen by 16 percent since 2007. Ergo, the decline in advertising mail volume must be the result of the recession, not electronic substitution.

(4) Various indirect measures of the volume of bills and bill payments—e.g., the number of credit card accounts, mortgages, new households—have fallen since 2007. These declines are the result of the recession. We can therefore assume that the decline in billing and payment mail volume since 2007 was the result of the recession rather than electronic substitution.

(5) Mail volume would be larger if the U.S. economy eliminated its "output gap"—the shortfall between actual GDP and the *additional growth above* the previous peak GDP that the economy hypothetically would have achieved but for the 2007-2009 recession.

None of these explanations withstand scrutiny. We respond to each one in turn.

a. The Postal Service has offered no evidence that the rate of electronic diversion has held constant since 2007.

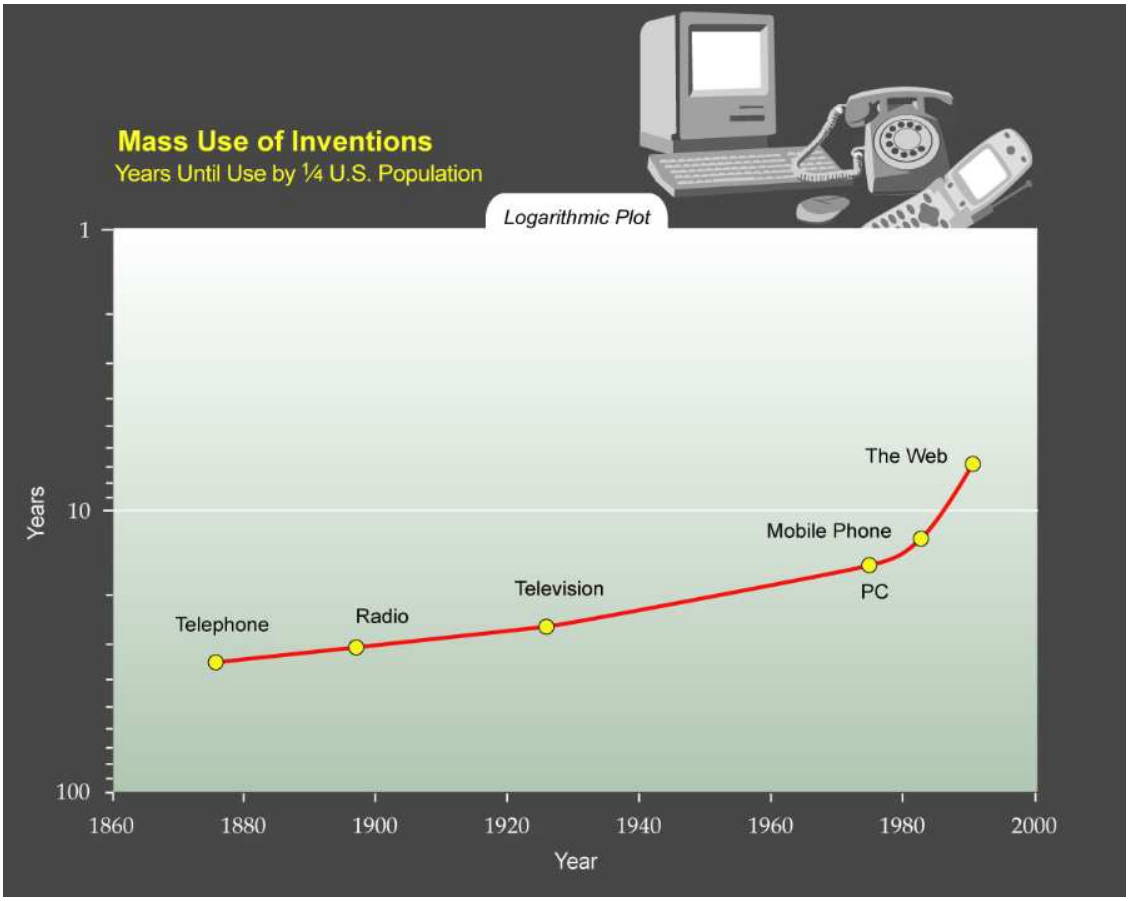
Mr. Thress's contention that the post-2007 acceleration in the decline of mail volume since 2007 necessarily must have resulted from the recession, not electronic diversion, assumes that the underlying rate of electronic diversion has held constant or slowed since 2007. *See* Thress Responses to POIR 2, Question 6, POIR No. 3, Question 1, POIR 4, Questions 2 and 6(c), POIR 5, Question 5, and POIR 6, Questions 12(c) and 25; Tr. 1/90, 93, 98 (Thress). The Postal Service has offered no support for this assumption, however, other than (1) data showing that the market shares older means of Internet access such as dial-up and broadband wireline ISP service are, respectively, declining and approaching saturation, and (2) Mr. Thress's professed inability to find a good way to model electronic diversion directly. *Id*. In fact, all indications are that the pace of electronic diversion has accelerated since 2007.

Mr. Thress argues that the rate of diffusion of an innovation generally takes the form of an S-curve: the diffusion starts slowly, accelerates after time, and eventually levels off as the innovation saturates its potential market. Since the S-curve for the adoption of any individual technology (e.g., wireline broadband service) sooner or later approaches saturation, he assumes that the growth of Internet substitution will flatten out as well. Thress Response to POIR 6, Question 25; Tr. 1/88-89, 91-93 (Thress).

Mr. Thress's reliance on the S-curve model would be reasonable if "Internet substitution" were the result of a single isolated innovation. Lundblad

Statement at 11-12 (citing Everett M. Rogers, *Diffusion of Innovations* (3rd ed. 1983)). It is not, however. Fundamentally transformative innovations like the Internet typically spawn a succession of derivative or complementary innovations, each with its own S-curve, that build on the earlier innovations in the field.[4] There is no evidence that the combined S-curve for the cornucopia of new products and services that daily expand the power of the Internet and the means of interacting with it is close to approaching a plateau. Indeed, technological innovation and its adoption in society appear to be accelerating at an exponential rate (please note that the vertical scale in the figure below is logarithmic, so a straight line represents an exponential rate of increase):

[4] *Cf*. William Rose, *The Most Powerful Idea in the World* (2010) (discussing the derivative and complementary innovations generated in response to the invention of the steam engine at the outset of the industrial revolution).



Source: Ray Kurzweil and Kurzweil Technologies (reproduced at http://en.wikipedia.org/wiki/File:PPTMASSuseInventionsLogPRINT.jpg).[5]

[5] Mr. Kurzweil, a pioneer in the field of artificial intelligence who was recently appointed Director of Engineering at Google, observed two years ago that "The exponential growth of information technologies is even greater: we're doubling the power of information technologies, as measured by price-performance, bandwidth, capacity and many other types of measures, about every year. That's a factor of a thousand in ten years, a million in twenty years, and a billion in thirty years. This goes far beyond Moore's law (the shrinking of transistors on an integrated circuit, allowing us to double the price-performance of electronics each year." Ray Kurzweil, "Singularity Q&A" (December 9, 2011) (http://www.kurzweilai.net/singularity-q-a). *See also* Phillip Ball, "Moore's Law Found to Apply to Evolution of Technologies Beyond Transistors," *Scientific American* (March 6, 2013) (www.scientificamerican.com/article.cfm?id=moores-law-found-to-apply-beyond-transistors&page=2).

Internet substitution fits this pattern. It results not from a single innovation, but from a cascade of related innovations, each of which has had its own S-curve of adoption. Some of the most important have been the walkie-talkie (1940), the stored-program digital computer (1940s), the transistor (1947), the integrated circuit (1958-59), ARPANET (early 1960s), cellular telephony (1973), the graphical user interface (1973), the first standardized Internet protocol (1974), the personal computer (mid-1970s), Internet email (1980s), the World Wide Web (1990), and wireline broadband and wireless broadband—all of which became commercially available before 2007. These and other advances in hardware and networks in turn have triggered the explosion of innovative devices, applications and services that have transformed American life since 2007. Among the most important post-2007 innovations are the iPhone and other smartphones; the Kindle, iPad and other tablets; and downloadable apps for both smartphones and tablets. Moreover, while Facebook and Twitter both existed in 2007, the number of active Facebook users has multiplied 20 times since then, and the number of tweets per day has multiplied approximately 90,000 times. The bandwidth, speed, and storage capacity of the Internet and the devices used to access it have also expanded exponentially since 2007. Lundblad Statement at 12-17; Tr. 1/93-96 (comments of Chairman Goldway and Vice-Chairman Taub); *id*. at 157 (comments of Commissioner Langley). In terms of the S-curve, electronic substitution is very much in the rapid take-off phase.

A similar acceleration of electronic substitution has occurred in recent years in other advanced economies. Economists on the staff of Royal Mail, studying the trend data, have concluded that the rate of electronic substitution in

the UK, including the acceleration of electronic substitution since 2005, has been driven primarily by advances in telecommunications technology:

> With regard to First Class non-presort traffic, the estimation of negative time-trend effects from 1987 is consistent with advances in telecommunication technology from the late 1980s onwards. In particular, it coincides with the timing of the widespread adoption of fax machines, the introduction of bill payments by direct debit and the development of electronic communication and business services in the 1990s. The increasing use of the Internet and Internet platform technologies coincides with the much higher negative time-trend estimate from 2002 onwards. *The First Class model estimates that the time-trend variable, on average, reduced mail volumes by about 4 percent per annum between 1987 and 2001; by around 7 percent between 2002 and 2005 as broadband subscriptions started to increase; and by approximately 13 percent per annum from 2005 onwards as e-communication technology has evolved and matured.*

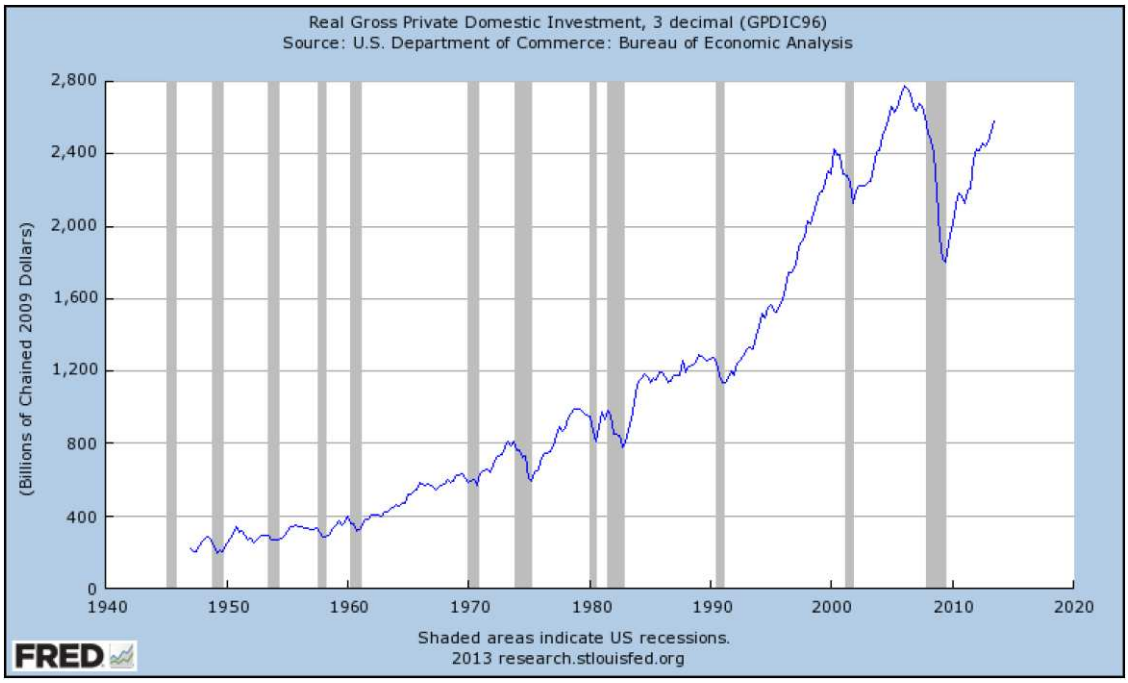
Marzena Jarosik *et al*., "Letter traffic demand in the UK: some new evidence and review of econometric analysis over the past decade," in M. Crew and P. Kleindorfer, eds., *Reforming the Postal Sector in the Face of Electronic Competition* (2013) at 203-4 (emphasis added) (quoted in Lundblad Statement at 12-13).

In this context, Mr. Thress's assumption that the rate of electronic diversion must have flattened out or even slowed because "Internet usage" (narrowly defined as the market penetration of 10- or 20-year-old technologies such as dial-up Internet access or wireline broadband access) is approaching saturation is doubly simplistic. First, his measure of Internet access ignores its newest and fastest-growing forms—wireless and Wi-Fi. Second, and more fundamentally, he ignores the distinction between (1) how many people

subscribe to Internet access, and (2) how much, and for what complementary applications and services, they use it. It is the latter dimension of Internet usage that ultimately determines the rate of electronic substitution.

b. The Postal Service has offered no evidence that the acceleration of the decline in mail volume after 2007 was caused by the recession.

Equally unsupported is Mr. Thress's alternative claim that the recent acceleration in electronic substitution is itself a result of the 2007-2009 recession. Thress Response to POIR 3, Question 1. He theorizes that recessions encourage business mailers to cut costs; electronic communications cost less than mail; ergo, the recession must have accelerated electronic diversion. *Id*. There are several obvious flaws with this hypothesis. First, it is pure speculation: he offers no evidence for it. Second, businesses continually look for ways to cut costs, not just during recessions. Third, enhancing the capacity of businesses to replace business-to-consumer and consumer-to-business mail with electronic communications typically requires a large and costly up-front investment in servers, software, programming, and other infrastructure. Capital investment typically *declines* during recessions, and did so sharply during 2007-2009:



Federal Reserve Bank of St. Louis, "Real Gross Private Domestic Investment, 3 decimal (GPDIC96)" (http://research.stlouisfed.org/fred2/series/GPDIC96). For all of these reasons, the Postal Service stood on sounder footing last year when it acknowledged that "The Economy is NOT the Main Cause of Diversion." USPS Plan to Profitability: 5 Year Business Plan (February 16, 2012) at 5.

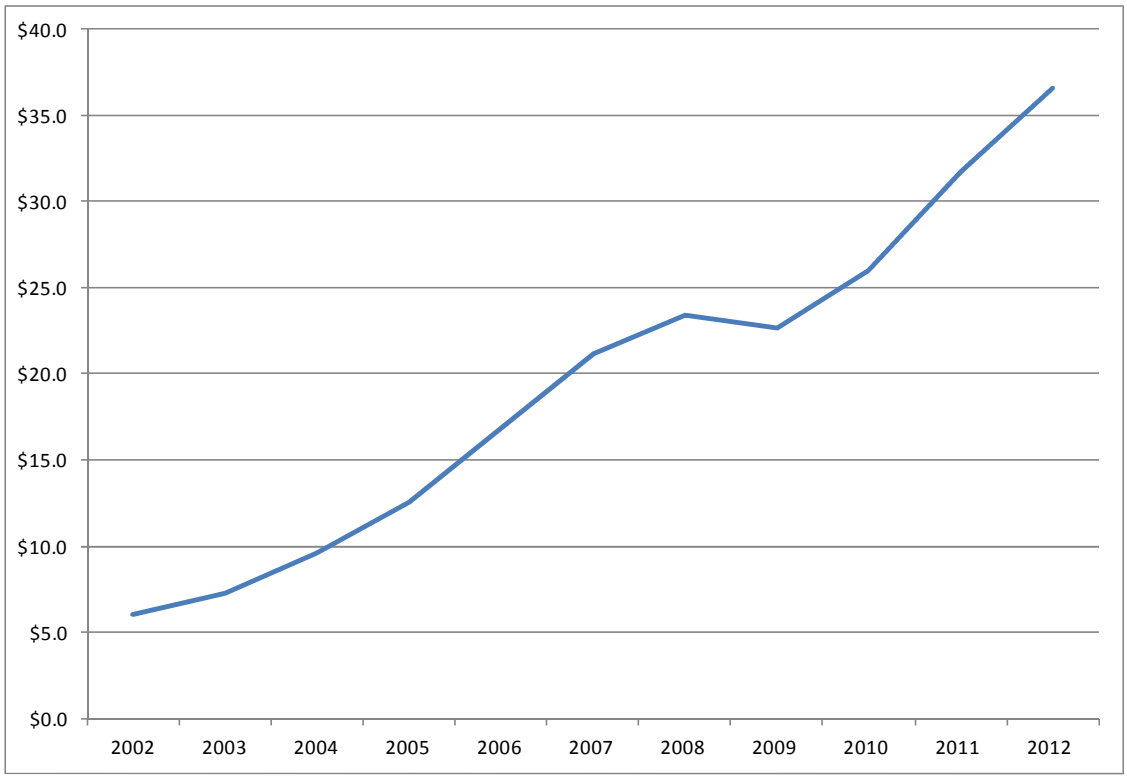
c. The decline in advertising mail volume between 2007 and 2012 resulted primarily from electronic diversion; the decline in *total* advertising spending was modest.

Mr. Thress's attempt to blame the decline in advertising mail volume on a recession-related decline in *overall* advertising spending, rather than electronic diversion, is also largely incorrect. Thress Responses to POIR 1, Questions 4.c and 9, POIR 3, Question 2, and POIR 6, Questions 19-20; Tr. 1/86-87 (Thress).

The Postal Service contends that the decline in advertising mail volume between FY 2007 and FY 2012 was due in large part to a cumulative decline of approximately 15 percent in total spending on advertising, a decline that the Postal Service attributes to the recession. Thress Response to POIR 3, Question 1; Tr. 1/124, 139-144 (Thress). In fact, total spending on advertising *other than* direct mail declined by no more than five percent during this period. Swallen (Kantar Media) Statement at 2-3.

The main reason for the disproportionate decline in advertising mail volume between FY 2007 and FY 2012 was the migration of advertising from direct mail to the Internet and other non-mail channels. Lundblad Statement at 18-20. Internet advertising revenue multiplied six times from 2002 to 2012. At approximately $37 billion in 2012 advertising revenue, the Internet is now a major competitor for mail in the advertising marketplace:

Internet Advertising Revenue (in Billions of Dollars)



Lundblad Statement at 18-19. The growth in market share of advertising over the Internet during this period has caused the Postal Service's direct mail market share to drop substantially. From 2007 to 2012, ad spending has declined no more than five percent. Swallen (Kantar Media) Statement at 2-3. But direct mail ad spending declined *23 percent*. Lundblad Statement at 19-20.

The Postal Service's most recent Household Diary Study acknowledges the role of Internet diversion in eroding the share of total advertising spending capture by direct mail:

> However, the weak economic recovery led to only a small increase in total advertising spending. A large increase in Internet advertising left fewer funds available for more traditional advertising methods such as direct mail. As shown in Table 5.1, direct mail

> spending declined 5.9 percent compared to 2011; Internet advertising, on the other hand, increased 14.4 percent, by far the strongest spending growth compared to all other media categories.

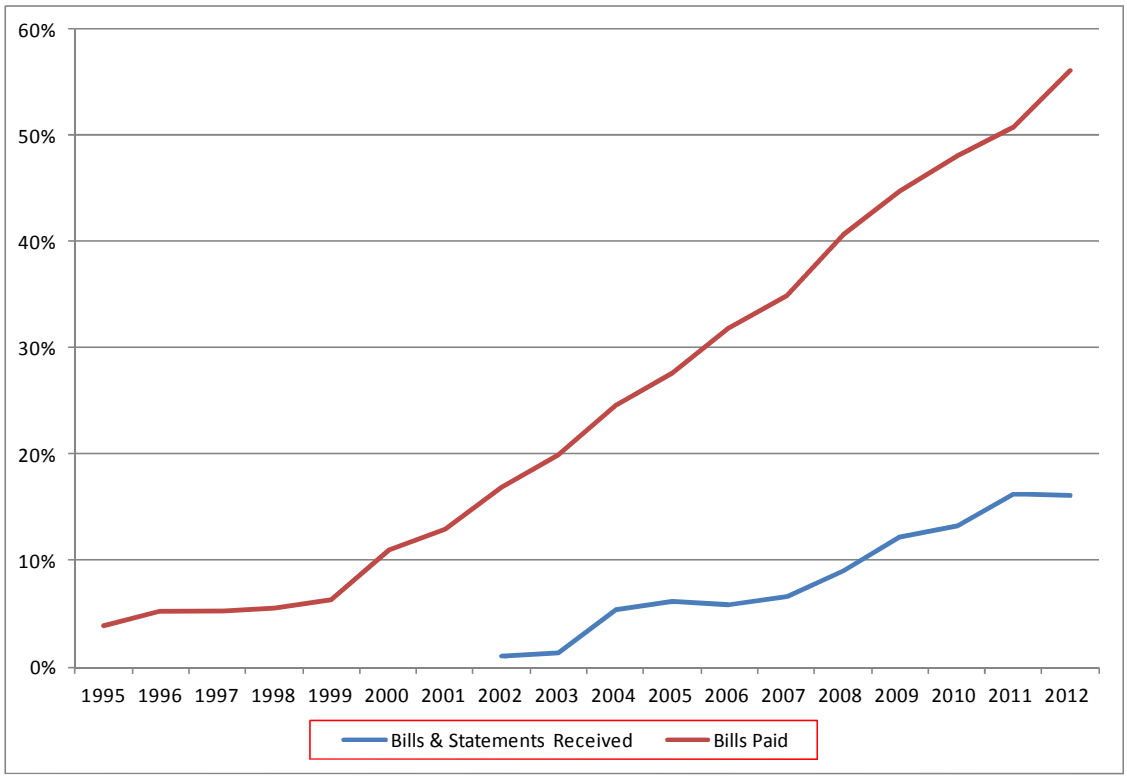
FY 2012 Household Diary Study at 39.

d. The decline in bills and bill payments sent by mail between 2007 and 2012 was caused by electronic diversion; the *aggregate* volume of household bills and bill payments *increased*.

Equally unsupported is Mr. Thress's attempt to blame the recession for the decline in billing and bill payment mail since 2007. Thress responses to POIR 1, Question 9, and POIR 3, Question 1.

The Postal Service's own Household Mail Diary confirms that the main cause of the decline in billing and bill payment mail is electronic diversion. From 2007 to 2012, the percentage of bills paid electronically increased from 35 to 56 percent. And while the penetration of Internet bill/statement presentment has lagged behind that of bill payment, the percent of bills/statements presented by Internet has more than doubled since 2007:

Share of Bills & Statements Received by Internet and Paid Electronically



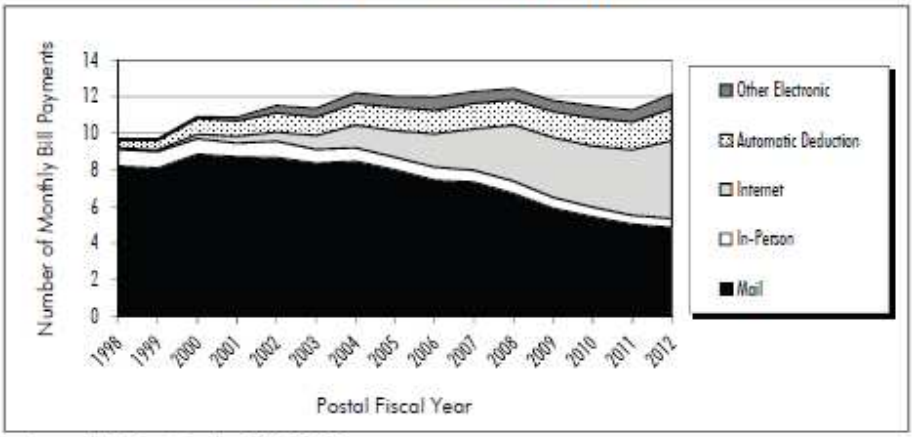
Lundblad Statement at 17.

Furthermore, the increase in the percentage of bills and statements presented through the Internet is only one—and likely not the largest—contributor to the migration of bills and statements from mail to electronic channels. The advent of 24/7 consumer access to account information through the Internet has greatly reduced the need to send account holders monthly statements. This innovation has reduced the percentage of accounts that generate a statement in any given month. For example, shifts from monthly to quarterly statements—a trend noted in the FY 2012 Household Diary Study (at 12)—reduce the annual volume of statements from a given account by two-

thirds. Hence, virtually all the decline in the volume of billing and bill payment mail between FY 2007 and FY 2012 was due to diversion, not to a decline in the total number of bills that households must pay each month. *Id*.

Mr. Thress tries to counter these figures by noting that the recession caused financial institutions to cancel or non-renew a large percentage of existing credit accounts; the number of such accounts has not recovered since then; and that other demographic measures potentially associated with the volume of bills and bill payments (e.g., the net rate of formation of new households) have slowed. Thress Responses to POIR 1, Question 9, POIR 3, Question 2, and POIR 6, Question 8(b); Tr. 1/101 (Thress). The number of credit accounts and the number of households, however, have at most an indirect relationship with the volume of bills and bill payments. The best evidence of billing and bill payment volume is the total number of bills that households actually pay. That figure, according to the Household Mail Diary for FY 2012, was virtually unchanged between FY 2007 to FY 2012:

Figure 4.1:
Monthly Average Household Bill Payment by Method



Source: HDS Diary Sample, FY 1998-2012.
Note: Other Electronic includes telephone.

FY 2012 Household Mail Diary at 33; Lundblad Statement at 17-18.[6] Mail volume fell because mail lost market share.

Likewise, while the "rate of household formation" may have "slowed" (Tr. 1/101 (Thress)), the number of households in the United States nonetheless continued to grow throughout the recession, and is higher today than in 2007:

Year	Number of Households (000)
2007	116,783
2008	117,181
2009	117,538
2010	119,927
2011	121,084
2012	122,459

Source: United States Department of Commerce, U.S. Census Bureau (www.census.gov/hhes/www/income/data/historical/household/2012/H09AR_2012.xls); U.S. Census Bureau, 2012 Statistical Abstract of the United States, Table 59 (http://www.census.gov/prod/2011pubs/12statab/pop.pdf).

[6] One possible reason that the decline in the number of financial accounts did not cause a reduction in the total volume of bills paid is that a high percentage of the accounts closed were inactive, and did not generate bills even before they were closed. In recent years, financial institutions have moved aggressively to close inactive credit accounts because of the risk they pose to issuers of credit. *See* Eric Dash, "Customers Feel the Next Crisis: It's Credit Cards." *The New York Times* (October 28, 2008); Mary Pilon, "Cardholders Get Rude Surprise at the Register," The Wall Street Journal (August 12, 2009); Brian O'Connell, "Use it or lose it: Issuers quick to close dormant accounts." *Creditcards.com* (December 4, 2008); "Why Inactive Credit Cards Can Damage Your Credit Score," *The Street* (February 17, 2009).

e. The supposed "output gap"

Mr. Thress also boasts that the Postal Service could have claimed as recession-related losses the shortfall between actual mail volumes and the hypothetical but unrealized *growth* in volume that the Postal Service assertedly would have realized but for the recession. Thress Responses to POIR 1, Question No. 6 (asserting existence of "output gap"), POIR 6, Question 1; POIR 3, Question 1; Tr. 1/132-136 (Thress). The Postal Service congratulates itself for "understating" its recession-related losses by refraining from including the impact of the "output gap" in the Postal Service's loss calculations. Thress Response to POIR 3, Question 4. There is no legitimate basis, however, for claiming these losses as recession-related.

First, the relatively slow growth of the economy since 2009 does not begin to explain the massive volume declines that the Postal Service attributes to the recession. Lundblad Statement at 31-32. Second, and in any event, the "output gap" theory is premised on an illegitimately broad role for exigent rate increases under 39 U.S.C. § 3622(d)(1)(E). The proper function of an exigent rate increase in the context of the 2007-2009 recession is to allow the USPS to recover *losses* in volume and contribution caused by the recession. That is a far cry from allowing the USPS to recover hypothetical *gains* that the Postal Service never realized—not even at the peak of the last business cycle. See Tr. 1/105 (comments of Chairman Goldway).

D. Thress's model skews the results by counting the negative cyclical effects of the recession, but excluding the positive effect of the post-recession recovery.

Mr. Thress's model further inflates the losses attributable to the 2007-2009 recession by recognizing its negative cyclical effect, but excluding the positive effect of the post-recession recovery that has occurred since 2009. Mr. Thress concedes this. Tr. 1/126-127 (Thress).[7] This approach is fundamentally incorrect. The recovery period is an integral part of the business cycle, and may not be simply assumed away. Lundblad Statement at 22-23. Mr. Thress's rejoinders that the recovery should be ignored because it has been slower than typical, or because the economy is growing more slowly than would have occurred absent the recession (Tr. 1/127), are non sequiturs. The role of an exigent rate increase under Section 3622(d)(1)(E) is to allow recovery, in some circumstances, of *losses*—not to compensate the Postal Service for levels of profitability that were never achieved, even in boom years.

[7] The thumb on the scales operates in the formula used to calculate the values in the "Total Macro" column (column AA) of the "Volume" worksheet of the same "ExigentImpact.xls" file. Consider, for example, row 53, which provides values for workshared First-Class letters in 2011. The value of the "employment" variable for that product and year (shown in cell D53) is + 328.650, meaning that changes in employment had a positive effect on mail volume in that year. The formula used to calculate the value in cell AA53, however, is SUM(MIN(SUM(D53:G53),0), V53:V53). The term "(MIN(SUM(D53:G53),0)" means the sum of the effects of the macroeconomic variables (i.e., cells D53 through G53) or zero—whichever is less. Equivalent versions of this heads-I-win, tails-you-lose formula populate the other rows of column AA. This means that the macro trends whose effects appear in columns D through G are considered when their net effect on volume is negative, but ignored when their net effect is positive.

E. Other Flaws In Mr. Thress's Regression Methodology

The Postal Service's time series model has two other flaws. First, Mr. Thress has picked and chosen his macroeconomic and trend variables on an essentially *ad hoc* basis to find the trend start dates, functional forms, and optimization procedures that best fit the data each year. When curve-fitting of this kind is used, however, the results cannot be accepted as trustworthy without tests comparing the statistical fit of the trends that were included versus the statistical fit of the alternative trend lines that were rejected. Mr. Thress has provided no such analysis. Lundblad Statement at 23-24.

Second, Mr. Thress's model fails to deal adequately with the non-stationarity of the data he examined. The proper way to deal with non-stationary data is to look at the changes over time—to look at the rate of growth in mail volume rather than the mail volumes themselves. Failure to correct for non-stationary data can lead to spurious findings of correlation between variables when no correlation exists. Mr. Thress failed to employ the required statistical safeguards. Lundblad Statement at 24-27.[8]

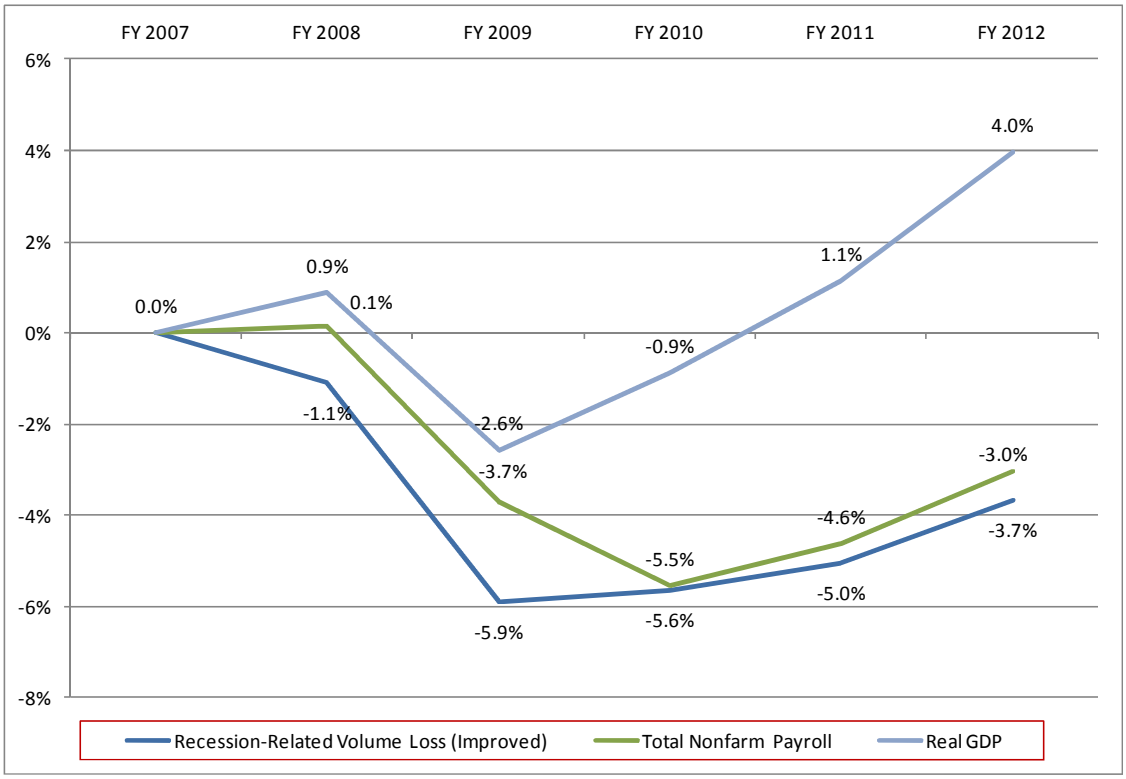
[8] For a simple explanation of the problem of nonstationary random variables, *see* Michael P. Murray, "A Drunk and Her Dog: An Illustration of Cointegration and Error Correction," 48:1 *American Statistician* 37 (February 1994).

F. Reasonable Adjustments To The Thress Analysis Reduce His Estimate Of FY 2012 Recession-Related Losses To Approximately $500 Million.

For a more realistic estimate of the losses actually incurred by the Postal Service in FY 2012 and subsequent years as a result of the 2007-2009 recession, Professor Lundblad and SLS Consulting have modified the Excel spreadsheets submitted as part of Mr. Thress's library references by (1) eliminating his arbitrary interpretation of the time trend variables in his equations as recession-related; (2) including the positive effects of economic recovery as well as the negative effects of the downturn in calculating the overall effect of the recession; and (3) excluding the trend component of macroeconomic variables from the effect of the recession. Lundblad Statement at 38-42.

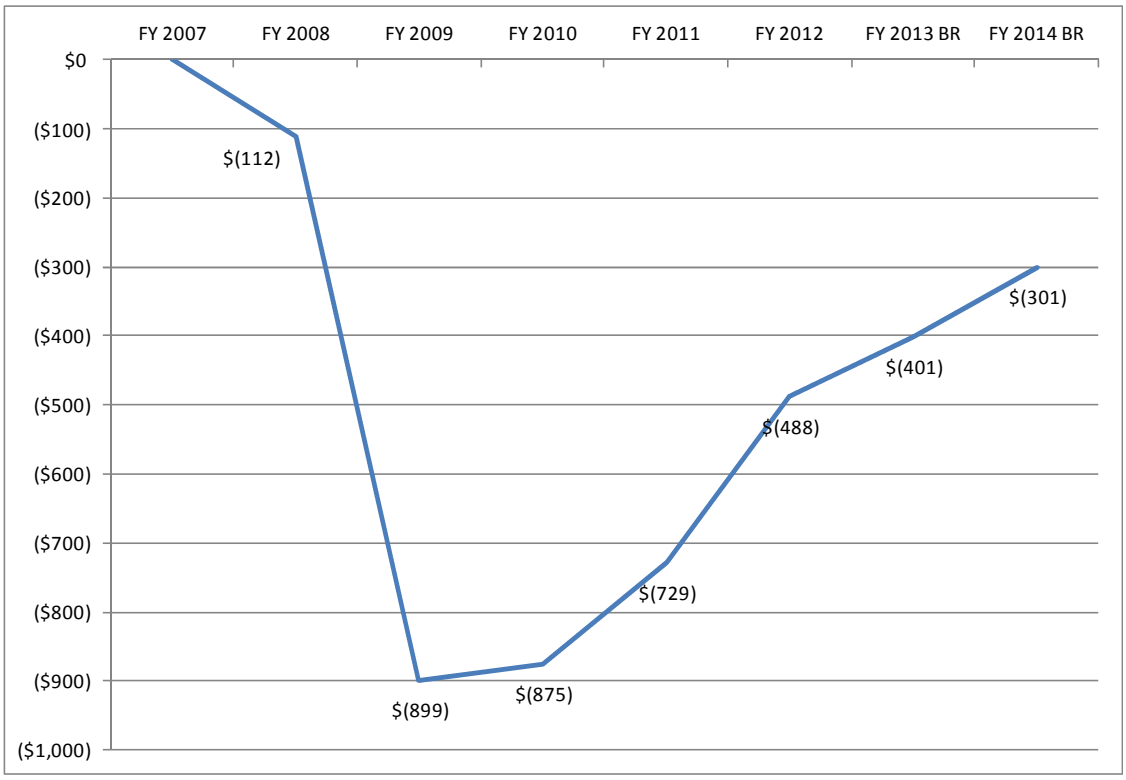
This restated analysis shows that the mail volume losses due to the recession bottomed out at six percent, recovered to 3.7 percent in FY 2012; and are projected to recover further to 3.1 percent in FY 2013 and 2.4 percent in FY 2014:

Cumulative Percent Change in Market Dominant Mail Volume and Macroeconomic Variables from FY 2007



Lundblad Statement at 41; Library Reference MPA *et al*.-LR-R2013-11/2, LR-2.xlsx, "Figures". These loss estimates are much more consistent with the percentage changes in the overall economy, and the results of the risk exposure analyses performed by Mr. Lundblad, than the extravagant loss claims sponsored by Mr. Thress.

The contribution losses associated with these more realistic volume loss estimates were $899 million in FY 2009, $488 million in FY 2012, $401 million (projected) in FY 2013, and $301 million (projected) in FY 2014:



Lundblad Statement at 42; Library Reference MPA *et al*.-LR-R2013-11/2, LR-2.xlsx, "Figures".

II. THE COMMISSION SHOULD LIMIT ANY EXIGENT RATE INCREASE SO THAT IT PROVIDES NO MORE THAN $351 MILLION IN EXTRA CONTRIBUTION PER YEAR, AND EXPIRES IN TWO YEARS.

If the Commission finds that the 2007-2009 recession is in fact responsible for a quantified share of the Postal Service's losses, the next step is to translate those losses into price increases. Here, too, the Postal Service overreaches.

G. The Total Projected Increase in Contribution From Any Exigent Price Increase Should Not Exceed a Reasonable Estimate of the Postal Service's Recession-Related Losses During the Next Two Years.

The Postal Service would have the Commission compound the Postal Service's overstatement of its actual recession-related losses in FY 2012 by allowing the proposed rate increase to remain in effect indefinitely, and be incorporated into the base rate for future increases. Tr. 2/186 (Nickerson) (Postal Service intends to have the increase "live on into the future"); *id*. at 2/222 ("we could very well be talking about the effects of the great recession 20 years from now"). This would lead to massive excess recovery of the Postal Service's recession-related losses *even if the additional annual contribution to the Postal Service were limited to the losses actually incurred by the Postal Service in FY 2012 as a result of the 2007-2009 recession*.

There is an enormous difference between the value of a rate increase that is rescinded after one year and the value of the same rate increase if allowed to remain in effect beyond a single year. The Postal Service states that it seeks $1.78 billion in added contribution from this case. If the Postal Service were granted this increase, and used the increased rates as the starting point for future CPI-based rate adjustments, the Postal Service would garner an extra $1.78 billion in contribution every year regardless of whether it incurred any further losses from the 2007-2009 recession in that year. The limiting case would be a rate increase of perpetual duration: at a discount rate of 2.8 or 2.9 percent (the approximate discount rate adopted by the Postal Service for workers' compensation liability), the present value of a perpetual stream of $1.78

billion is approximately *$60 billion*.[9] The same violation would result, albeit on a smaller scale, from approval of an exigent increase limited to the average annual contribution loss of approximately $397 million estimated by Professor Lundblad for FY 2012 through FY 2014, if the increase were allowed to remain in effect permanently.

This over-recovery would violate 39 U.S.C. § 3622(d)(1)(E) in several ways. The Postal Service would be receiving revenue to cover losses that (if they occurred at all) could not possibly be regarded as "due to" the 2007-2009 recession; which have not be shown to be "necessary" for continued operation of the Postal Service in those out-years; and which would directly violate the "reasonable and equitable" requirement of the statute. This outcome would be unlawful:

> [T]he statutory requirement that an exigent rate adjustment be 'reasonable and equitable and necessary to enable the Postal Service, under best practices of honest, efficient, and economical management, to maintain and continue the development of postal services of the kind and quality adapted to the needs of the United States' reflects congressional intent to ensure that the justifications for exigent rate adjustments are carefully scrutinized. See 39 U.S.C. § 3622(d)(1)(E). Even if the Postal Service demonstrates that proposed adjustments are "due to" exigent circumstances, it may not obtain an exigent rate adjustment unless the proposed

[9] The Postal Service used the discount rates of 2.8 and 2.9 percent in its USPS Form 10-Q for 3Q 2013 at 18. The formula for the present value of a perpetual constant real stream of income is

$$PV = \frac{C}{(1+r)^1} + \frac{C}{(1+r)^2} + \frac{C}{(1+r)^3} \ldots = \frac{C}{r}$$

where C is the amount of the annual income and *r* is the discount rate.

> adjustments also meet the "reasonable and equitable and necessary" tests.

Order No. 864 at 51; *accord*, 39 C.F.R. § 3010.61(a)(6) (requiring the Postal Service to submit "explanation of when, or under what circumstances, the Postal Service expects to be able to rescind the exigent increases in whole or in part").

The Postal Service, acknowledging these requirements, suggested in its Request that it might rescind an exigent increase "if Congress makes fundamental changes to the postal business model that render the additional contribution provided by the increase unnecessary." Request at 17. This nod to the possibility of rescission does not begin to render lawful the open-ended increase that the Postal Service seeks.

First, the Postal Service offers neither a binding commitment nor a fixed sunset date nor even a list of conditions subsequent, but merely a statement of intent to think about the issue someday. *Id*. ("a determination of whether and when to rescind the increases must be deferred until such time as Congress enacts comprehensive reform legislation"); Tr. 2/184-185 (Nickerson) ("the devil is sort of in the details of what the particulars of congressional legislation would be . . . I don't know what shape that would be in all honesty because we're not there yet."); *id*. at 2/225 (Nickerson).[10]

[10] Indeed, the Postal Service makes clear that it reserves the right to seek an *additional* exigent increase, based on the *same* FY 2012 losses asserted in this case. *See* USPS Response to POIR 5, Question 2(b) (stating that the Postal Service has "no present intention" to seek a second exigent increase to recover its losses in FY 2012).

Second, even a fixed and binding advance commitment today to rescind the exigent increase upon the enactment of legislative forms would not cure the violation. The Postal Service's losses have multiple causes. The only losses recoverable in this case, however, are those caused by the 2007-2009 recession. Section 3622(d)(1)(E) does not authorize the Postal Service to recover---forever, for two years, or for two months—losses that stem from other causes. As the Commission made clear in Docket No. R2010-4,

> the "due to" requirement prevents a *bona fide* extraordinary or exceptional circumstance from being misused as a general revenue enhancement mechanism that circumvents the rate cap system enacted by the PAEA. Such a result would be inconsistent with the broader statutory context in which section 3622(d)(l)(E) appears and with the purposes for which the PAW was enacted.

Order No. 547 (September 30, 2010) at 56.

Instead, the Commission should limit the duration and amount of any exigent price increases allowed in this docket so that the total projected increase in contribution does not exceed a reasonable estimate of the Postal Service's recession-related losses. A reasonable maximum duration for the exigent price increases would be 24 months after they take effect; after that, the increases should be rescinded. As Professor Lundblad demonstrates, the losses in mail volume that can be plausibly attributed to the 2007-2009 recession have been diminishing rapidly with each passing year. Moreover, more than ample time has passed for the Postal Service to adjust to the diminished revenue and volume it can reasonably expect in a world of electronic communications. By January 2016, the end of the two-year period, the 2007-2009 recession will be almost

seven years in the past. The Postal Service needs to adapt, as its customers have, to the new normal. *See* Tr. 1/104-106 (comments of Chairman Goldway and Vice Chairman Taub); Tr. 1/140 (comments of Commissioner Acton). Even Mr. Thress conceded that Section 3622(d)(1)(E) cannot be used indefinitely to recover the losses caused by a long-term downward shift in the demand for mail:

> [T]o the extent these trends continue in the future, and this is the new normal, it does seem -- it does make sense to me that there will come a point in time where somebody has to just kind of bite the bullet and say, okay, mail volume is -- first-class mail volume is falling 5 billion pieces a year. You have to do something to adjust to that. You can't come back and ask for an exigent rate increase every year for that.

Tr. 1/122 (Thress).

The *magnitude* of the exigent increases during their two-year effective life should not exceed the losses in contribution that the Postal Service may reasonably attribute to the 2007-2009 recession between January 26, 2014, and January 26, 2016. The projections of recession-related losses developed by Professor Lundblad for Fiscal Years 2013 and 2014—approximately $401 million in FY 2013 and $301 million in FY 2014—serve as generous estimates of the losses likely during January 2014-January 2016. Lundblad Statement at 38-42. Averaging these amounts over two years yields a contribution increase of approximately $351 million per year. This is the upper bound on what the Postal Service may reasonably receive in this docket.

H. The Postal Service Should Receive No Recovery Of Past Losses.

The Postal Service based its September 26 Request solely on allegedly recession-related losses in Fiscal Year 2012; the Postal Service did not propose to recover any losses that were incurred in FY 2011 or earlier years. As the Postal Service's original claims have come into question, however, the Postal Service has tried to buttress its case by suggesting that keeping an exigent rate increase in effect indefinitely into the future could be justified as a way of "making up the deficit that [the Postal Service] had from the recession" in years *before* Fiscal Year 2012 as well as FY 2012 itself. Tr. 2/191, 197, 200, 211-213 (Nickerson); cf. Tr. 2/198 (Chairman Goldway) ("So are you saying when we expect that the Postal Service should be credited for losses in the old normal for year after year that that makes sense?"); *id*. at 200 ("I'm trying to understand how providing the Postal Service with money to make up the losses for the recession is something that can go on year after year after year.").

Using an exigent rate increase to "make up" for recession-related losses in past years would be unlawful. Losses, even if caused by an exigent circumstance, may not be recovered through an exigent rate increase unless recovery of the losses is "necessary" for the Postal Service to continue to provide service. 39 U.S.C. § 3622(d)(1)(E). Recovery of the Postal Service's losses in Fiscal Year 2012 or earlier years is not "necessary" in that sense. Constrained by the CPI cap, the Postal Service downsized and cut costs; Congress provided relief by allowing the Postal Service to forego or defer several years of annual contributions to the Retiree Health Benefit Fund without "financial penalty or legal

penalty";[11] and the Postal Service continued to operate, meet payroll and provide mail service.[12] While the Postal Service undoubtedly would have preferred having more money, more money was not "necessary" within the meaning of Section 3622(d)(1)(E).

I. The Portion Of The CPI-Based Rate Increase Disallowed By The Commission In Docket No. R2013-10 May Not Be Recovered In This Case.

Five days ago, the Commission issued its final decision in Docket No. R2013-10, *Notice of Market-Dominant Adjustment*, the most recent CPI-based price adjustment case. Order No. 1890 (issued November 21, 2013). In its order, the Commission held that the Postal Service, if it proceeds to implement the Full Service IMb mail preparation requirements that are scheduled to take effect on January 26, 2014, must reduce the proposed CPI-based rate increases to offset the additional revenue that would result under existing billing determinants if the Full Service IMb requirements take effect. *Id*. at 35-37, 106-107.

In footnote 63 to Order No. 1890, the Commission added that "There may be other methods of implementing the Full Service IMb requirements that properly account for their effects. *See also* Renewed Exigent Request of the

[11] Tr. 2/196-197 (colloquy between Mr. Nickerson and Chairman Goldway).

[12] Indeed, one may question whether an exigent rate increase is "necessary" even now. The Postal Service has as much cash on hand today as it did a year ago, and projects that it will have the same amount of cash on hand a year from now even without an exigent rate increase. Tr. 2/195-196 (Nickerson).

United States Postal Service in Response to Commission Order No. 1059, September 26, 2013, at 15, n.24." The cited footnote from the Request stated in relevant part:

> If the Docket No. R2013-10 rate increases are not approved, the Postal Service would amend this Request to incorporate all of the increases and classification changes sought in that docket. As a result, approximately $2.36 billion in contribution would be sought in this docket, which would still be well below Mr. Nickerson's calculation of the amount of contribution lost due to the recession through FY2009.

The revenue offset required by the Commission in Docket No. R2013-10 may not be recouped through a bigger exigent price increase in Docket No. R2013-11. Whether the USPS proceeds with its plan to mandate use of the Full Service IMb, and therefore must forego some of the additional revenue that would otherwise be available through the CPI-based increases approved in R2013-10, is irrelevant to the present case. The obligation to forego the extra money does not qualify as an extraordinary or exceptional circumstance. The Commission's ruling on the issue is consistent with longstanding Commission precedent:

> The Commission has repeatedly emphasized that, for purposes of calculating the percentage change in rates, whenever possible, adjustments to billing determinants shall be based on known mail characteristics or historical volume data, as opposed to forecasts of mailer behavior.

Order No. 1890 at 33 (citations omitted). Indeed, the approach followed by the Commission in Order No. 1890 was first proposed in 2007, by the Postal Service itself. *Id*. at 33-34 & nn. 55-59.

CONCLUSION

Wherefore, the undersigned parties respectfully request that the price increases requested by the Postal Service be limited as explained in these comments.

Respectfully submitted,

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Counsel for Time Inc.

November 26, 2013

LIST OF SUPPORTING MATERIALS

1. Statement of Christian T. Lundblad

2. Statement of Jon Swallen

3. Library Reference MPA *et al*.-LR-R2013-11/1 (workpapers for Professor Lundblad's comparison of the estimate of recession-related volume losses estimated by the USPS vs. restated estimates prepared by Professor Lundblad)

4. Library Reference MPA *et al*.-LR-R2013-11/2 (spreadsheet of the data underlying many of the figures and tables in Professor Lundblad's statement)

5. Library Reference MPA *et al*.-LR-R2013-11/3 (workpapers for Professor Lundblad's exploratory and employment/output gap analyses)

STATEMENT

OF

CHRISTIAN T. LUNDBLAD

BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, D.C. 20268-0001

RATE ADJUSTMENT DUE TO EXTRAORDINARY OR EXCEPTIONAL CIRCUMSTANCES	)))	Docket No. R2013-11

STATEMENT OF
CHRISTIAN T. LUNDBLAD
ON BEHALF OF
MPA—THE ASSOCIATION OF MAGAZINE MEDIA,
ASSOCIATION FOR POSTAL COMMERCE,
THE AMERICAN CATALOG MAILERS ASSOCIATION, INC.,
DIRECT MARKETING ASSOCIATION, INC.,
ALLIANCE OF NONPROFIT MAILERS,
ASSOCIATION OF MARKETING SERVICE PROVIDERS,
MAJOR MAILERS ASSOCIATION,
NATIONAL NEWSPAPER ASSOCIATION,
PRINTING INDUSTRIES OF AMERICA,
QUAD/GRAPHICS, INC., R.R. DONNELLEY,
SOFTWARE & INFORMATION INDUSTRY ASSOCIATION/
AMERICAN BUSINESS MEDIA, AND TIME INC.

November 26, 2013

STATEMENT OF
CHRISTIAN T. LUNDBLAD

My name is Christian T. Lundblad. I submit this Statement on behalf of the mailers and mailer trade associations shown on the cover.

I. BACKGROUND AND QUALIFICATIONS

I am the Edward M. O'Herron Distinguished Scholar and Professor of Finance at the University of North Carolina's Kenan-Flagler Business School. I have been on the faculty of the school since 2006. I was Assistant Professor of Finance at Indiana University from 2001-2006. During 2000-2001, I served as a financial economist at the Federal Reserve Board in Washington, D.C. I am an Associate Editor for the *Journal of Finance*, the leading academic finance journal.

I have a Ph.D. in financial economics and an M.A. in economics from Duke University, and a B.A. in economics and English literature (with highest honors) from Washington University in St. Louis.

My research spans asset pricing and international finance, with a specialization in emerging market development, and a heavy reliance on time-series econometrics. My research has been published in leading academic journals such as the *Journal of Finance*, the *Review of Financial Studies*, and the *Journal of Financial Economics*, and has been cited in general press by outlets such as *The Economist* and Reuters.

Of particular relevance, my published research has analyzed the macroeconomic risk exposure of individual firms—i.e., the sensitivity of corporate

earnings to the business cycle and other macroeconomic developments. An example of this work is "Consumption, Dividends, and the Cross-Section of Equity Returns," with Ravi Bansal and Robert Dittmar, *Journal of Finance*, vol. 60, pp. 1639-1672 (2005).

My curriculum vitae is attached to this Statement.

II. INTRODUCTION AND SUMMARY

The purpose of this Statement is to analyze the time series regression analysis that Thomas E. Thress, a consultant for the Postal Service, has sponsored in this case, and the interpretations that Mr. Thress and the Postal Service have drawn from those equations about the causal relationship between the 2007-2009 recession and the decline in the Postal Service's mail volume between Fiscal Year 2007 and Fiscal Year 2012. For the reasons explained in this Statement, the structure of the Postal Service's equations, and the inferences that the Postal Service draws from those equations, greatly overstate the share of the decline in Postal Service mail volume between Fiscal Years 2007 and 2012 that can be properly attributed to the 2007-2009 recession.

The Postal Service, relying on Mr. Thress, estimates that (1) the recession caused a 25.6 percent mail volume decline from FY 2007 to FY 2012; and (2) this impact will continue to grow in future years. These are extraordinary claims. Real (i.e., inflation-adjusted) gross domestic product (GDP), for example, declined by only four percent during the recession and has since rebounded into positive territory.

The more extreme loss estimates derived by Mr. Thress result from three major errors in his interpretation of the results of his econometric model:

(1) More than two-thirds of the volume losses between FY 2007 and FY 2012 that the Postal Service attributes to the recession are associated not with explanatory variables—including explicit macroeconomic variables such as GDP—but with simple *time trend* variables that he added to his equations to account for the residual changes in volume that his explanatory variables could not explain. Mr. Thress assumes that if a trend began at about the same time as the recession, the recession must have caused the trend. The Postal Service offers little economic and no econometric evidence to support this assumption, which confuses correlation with causation. A much more plausible explanation for the decline in mail volume from 2007 to 2012 is the increase in competition from, and customer acceptance of, electronic alternatives to mail during this period. Overcoming this obvious confounding cause would require a cogent theoretical construct backed by overwhelming empirical proof, neither of which the Postal Service has offered for its counterintuitive hypothesis.

(2) The Postal Service attributes to the recession the impact on mail volume of macroeconomic trends that had turned negative well before the onset of the recession. This is improper. Recessions are cyclical events—that is, they begin when economic activity

begins to diminish and end when economic activity begins to grow again. Given the short-term cyclical nature of recessions, the impact of macroeconomic variables should be attributed to the recession only when those variables are cyclical.

(3) The Postal Service's analysis excludes the positive impact on mail volume of the post-recession recovery of the economy. The recovery, while sluggish, nonetheless has had a positive effect on mail volumes. This effect cannot be ignored.

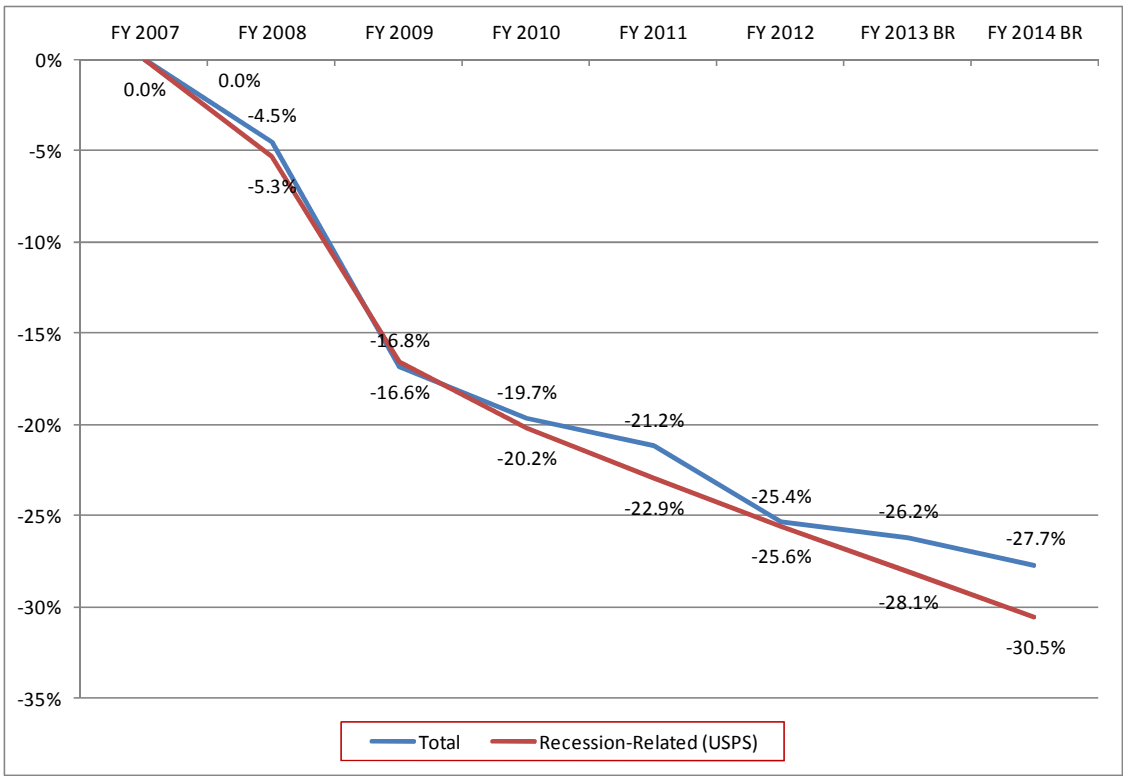
After discussing these flaws, I provide several exploratory analyses, based on standard macroeconomic modeling techniques, to indicate the approximate order of magnitude of the actual effects of the recession on mail volume. Comparing the results of these exploratory analyses makes clear that the Postal Service has substantially overstated the impact of the recession on mail volumes. Finally, based upon an economically sound interpretation of the Postal Service's econometric models, I estimate that the impact of the recession on USPS finances peaked in FY 2009, at a cost to the Postal Service of about $900 million in lost contribution in that year. The loss in contribution caused by the recession has moderated since then, to approximately $500 million in FY 2012. The same analysis indicates that the 2007-2009 recession caused the Postal Service to suffer a volume loss that peaked at 5.9% in FY 2009, and has moderated since then. These estimates, unlike those offered by the Postal Service in this case, are consistent with the effect that the recession has had on the economy as a whole.

III. THE POSTAL SERVICE'S TIME SERIES ANALYSIS SUFFERS FROM MAJOR FLAWS.

A. The Postal Service has derived its volume loss estimates by effectively assigning all volume losses between FY 2007 and FY 2012 to the 2007-2009 recession.

In later sections, I review the details of the Postal Service's approach for estimating recession-related volume losses and identify major problems with it. The details, however, should not obscure the big picture. Behind the complexities of Mr. Thress's time series model, the Postal Service has assigned essentially *all* loss of mail volume from FY 2007 to FY 2012 to the 2007-2009 recession. Figure 1 shows this:

Figure 1. Cumulative Percentage Market Dominant Mail Volume Change From FY 2007



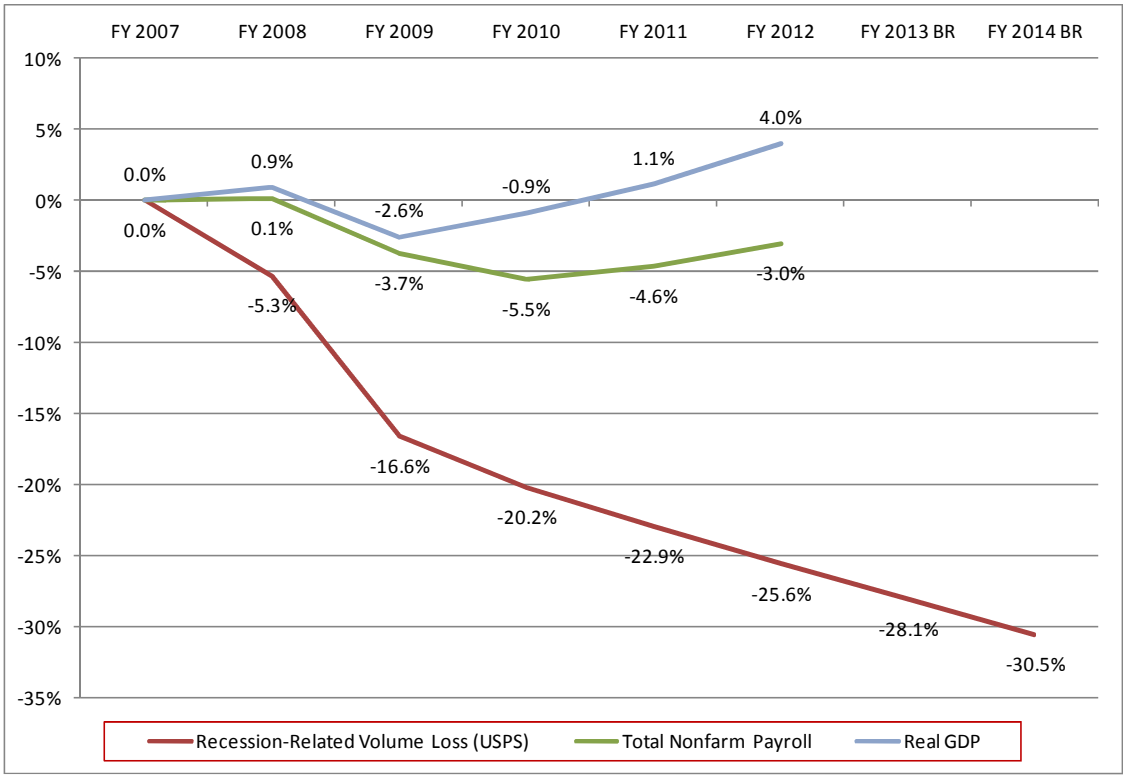
Source: MPA et al.-LR-R2013-11/2, LR-2.xlsx, "Figures"[1]

While the Postal Service has taken several measures to ensure this result, the most important one involves the Postal Service's use of simple time trend variables whose impacts increase every year. The Postal Service has created several trend variables beginning around the time of the recession to explain the very substantial residual changes in volume that the other explanatory variables in the model—including the explicit macroeconomic variables—do not explain. The Postal Service has classified as recession-related the effect of these trend variables on mail volumes. This classification sweeps a massive amount of unexplained and ever-increasing mail volume change—a cumulative 37.5-billion piece volume drop from FY 2007 to FY 2012, or more than two-thirds the total decline in volume—into the recession-related bucket.

The results of the Postal Service's approach are counterintuitive in several respects. First, attributing all volume losses since FY 2007 to the 2007-2009 recession implies that the recession caused a 25.6 percent decline in mail volume between FY 2007 and FY 2012. This percentage decline dwarfs the peak declines in standard measures of the recession, such as real gross domestic product (GDP) and employment. Figure 2 shows this:

[1] The library references referred to in this statement were prepared under my supervision as well as that of Dr. Stuart Elliott and Mr. Sander Glick of SLS Consulting, Inc.

Figure 2. Cumulative Percent Change in Market Dominant Mail Volume and Macroeconomic Variables from FY 2007



Source: MPA et al.-LR-R2013-11/2, LR-2.xlsx, "Figures"

Second, the *shape* of the Postal Service's estimates of the impact of the 2007-2009 recession on mail volumes is also anomalous. The effect of the recession on real GDP and employment peaked in FY 2009 and FY 2010, respectively, and has attenuated greatly since then. Indeed, real GDP was higher in FY 2012 than it was in FY 2007. However, the annual volume and contribution losses attributed by Thress to the recession grow *deeper* every succeeding year even as the economy recovers.

The sort of near-permanent negative trend that Thress is attributing to the recession is simply not the sort of change that recessions on their own produce.

As an instructive comparison, Table 2 shows the two-year mail volume change before and after earlier recessions. This is designed to give a general picture of the nature of mail volume growth in the years leading up to and after a recession. The table demonstrates that the effect USPS is postulating to have occurred after the 2007-2009 recession is inconsistent with how recessions behave:

Table 2. Two-Year Percent Change in Market Dominant Volume Before and After Recessions

Recession	Before	After
Nov 1973 - Mar 1975	3.8%	9.2%
Jan 1980 - Jul 1980 & Jul 1981 - Nov 1982*	9.8%	12.1%
Jul 1990 - Mar 1991	7.5%	6.8%
Mar 2001 - Nov 2002	6.0%	3.3%

*Treated as one for producing table due to closeness in timing

Source: MPA et al.-LR-R2013-11/2, LR-2.xlsx, "Mail Volume & Recession"

Third, Mr. Thress's use of trend variables as proxies for the effects of the recession is contrary to the general consensus among econometricians that trend variables are better used to explain longer-run trends than to explain short-term business cycle effects. Peter Bernstein, a fellow vice-president at Mr. Thress's consulting firm, emphasized this point in testimony for the Postal Service in 2006. In Mr. Bernstein's own words, economic factors "act as better explanations for short-term variations in volume growth around an existing trend." PRC Docket No. R2006-1, Testimony of Peter Bernstein (USPS-T-8) at 9.

B. The Postal Service Offers No Economic or Econometric Evidence to Support Its Assumption That Mr. Thress's Trend Variables Are Recession-Related.

Given the counterintuitive results of Mr. Thress's interpretation of the trend variables as recession-related, one would have expected the Postal Service to provide powerful evidence, both economic and econometric, to support this critical link. The Postal Service has provided no such support. Rather, the Postal Service appears to have simply assumed that, because the trends began at about the same time as the recession, the recession must have caused the trends. This is a fundamental error: correlation does not prove causation.

While mail volume data are certainly trending down over time, and trend variables can help fit this evolution statistically, the existence of a correlation between the trend variables and the volume data cannot by itself support any inferences about the causes of the trend. Trend variables, while potentially helpful for forecasting, are of themselves without economic content. A research paper that tried to interpret a trend variable as a measure of the effect of the recent recession, without thorough theoretical and economic identification of the precise means by which the effect operated, would not be accepted for publication by any reputable economics or finance journal.

In response to Presiding Officer's Information Requests in this case, Mr. Thress has tried to justify his interpretation of the trend variables by providing information on (1) the number of loan accounts by year; (2) advertising market share; and (3) the output gap. In Section III.C., I discuss the first two pieces of data. Section IV addresses Thress's reference to the output gap.

C. The Postal Service's analysis of Mr. Thress's trend variables ignores the substantial technical innovation during the past decade that surely accelerated the electronic diversion of mail volume and would have done so in the absence of the recession.

The lack of evidence that the trend variables reflect the effects of the recession is compounded by the Postal Service's failure to disprove another, far more plausible, interpretation of the same trend variables. Both the trajectory and the timing of these variables suggest that they are related to the progression of electronic diversion, with the revolutionary innovations in technology, and the rapidly growing acceptance of these innovations by businesses and consumers, that have occurred during the past decade.

It is hardly news that Americans—businesses and consumers alike—are growing increasingly comfortable with living and transacting business electronically, and that this growing comfort has resulted in substantial shifts from paper to electronic communication. It is also hardly news that the pace of these changes has increased over the past few years. The resulting acceleration of "electronic diversion" of communications from mail to other channels since 2007 is unsurprising.

As illustrated perhaps most famously by the S-curve of technology diffusion, the adoption of new technologies does not occur in a uniform straight line pattern:

> When the number of individuals adopting a new idea is plotted on a cumulative frequency basis over time, the resulting distribution is an s-shaped curve. At first, only a few individuals adopt the innovation in each time period (such as a year or a month, for example); these are the innovators. But soon the diffusion curve begins to climb, as more and more individuals adopt. Then the trajectory of the rate of

> adoption begins to level off, as fewer and fewer individuals remain who have no yet adopted. Finally, the s-shaped curve reaches its asymptote, and the diffusion process is finished.

Everett M. Rogers, *Diffusion of Innovations* (3rd ed. 1983), p. 23.

> As the level of innovation-evaluation information increases past a certain threshold, adoption is more likely to occur as the self-generated network pressures toward adoption increase. This relationship is positive but not linear and direct. As the rate of awareness-knowledge of the innovation increases up to about 20 to 30 percent, there is very little adoption. Then, once this threshold point is passed, each additional percentage of awareness-knowledge in the system is usually associated with several percentage increases in the rate of adoption. The diffusion effect means that until an individual has a certain minimum level of information and peer influence from his or her system's environment, he or she is unlikely to adopt. But once this threshold is passed (the exact threshold point is different for every innovation and every system), adoption of the idea is further increased by each additional input of knowledge and influence to the system's communication environment."

Id., p. 235.

Studies in the postal context have also found that (1) the volume impact of electronic diversion is nonuniform, and (2) in recent years, the economy has reached the portion of the diffusion curve where adoption is accelerating, generating increasingly negative effects on mail volume. For example, researchers in the UK recently found --

> With regard to First Class non-presort traffic, the estimation of negative time-trend effects from 1987 is consistent with advances in telecommunication technology from the late 1980s onwards. In particular, it coincides with the timing of the widespread adoption of fax machines, the introduction of bill payments by direct debit and the development of electronic communication and business services in the 1990s. The increasing use of the Internet and Internet platform technologies coincides with the much higher negative time-trend estimate from 2002 onwards, *The First Class model estimates that the time-trend variable, on average, reduced*

> *mail volumes by about 4 percent per annum between 1987 and 2001; by around 7 percent between 2002 and 2005 as broadband subscriptions started to increase; and by approximately 13 percent per annum from 2005 onwards as e-communication technology has evolved and matured.*

Marzena Jarosik, *et al*., "Letter traffic demand in the U.K.: some new evidence and review of econometric analysis over the past decade," in Michael A. Crew and Paul R. Kleindorfer, eds., *Reforming the Postal Sector in the Face of Electronic Competition* (Edward Elgar 2013), at pp. 203-204 (emphasis added).

Mr. Thress's consulting colleague, Peter Bernstein, has observed a similar time pattern in the electronic diversion of mail volume in the United States. In Docket No. R2006-1, Mr. Bernstein identified multiple shifts occurring well before the 2007-2009 recession in the relationship between changes in mail volume—in both First-Class Mail and Standard Mail—and GDP.[2] Table 2 from Bernstein's R2006-1 testimony shows that First-Class Mail was already growing more slowly than GDP in the 1990s, and that growth rate of Standard Mail also fell below the growth rate of GDP by the early 2000s. Both trends were under way before the 2007-2009 recession.[3]

[2] Testimony of Peter Bernstein for USPS, Docket No. R2006-1, USPS-T-8 (filed May 3, 2006).

[3] "This testimony demonstrates that the main reason for this decline is the continuing diversion of First-Class Mail volumes as a result of greater use of various technological alternatives." R2006-1, USPS-T-8 at 2.

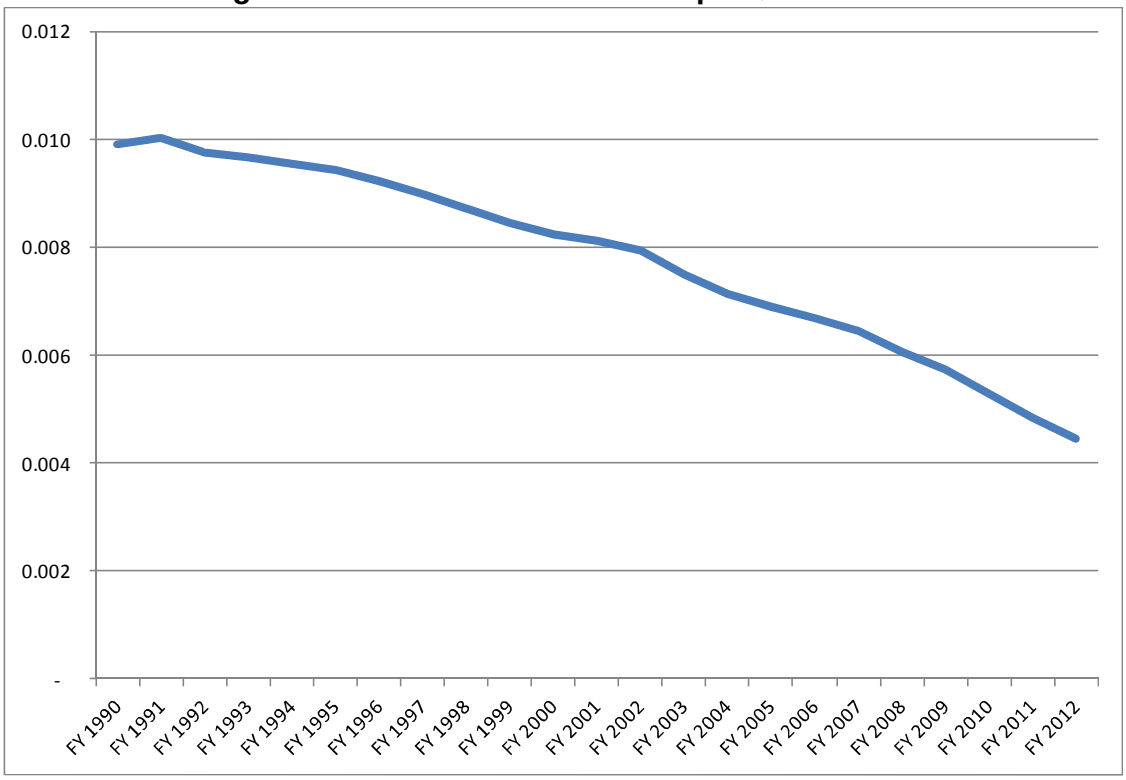
Table 2. First-Class Mail Volume, Standard Mail Volume, and Real GDP

Annual Avg. Change	1979-1991	1992-2000	2001-2005
First-Class Mail Volume	3.7%	1.6%	-1.1%
Real GDP	2.6%	3.7%	2.6%
Difference	**1.1%**	**-2.1%**	**-3.7%**
Standard Mail Volume	7.0%	4.2%	2.3%
Real GDP	2.6%	3.7%	2.6%
Difference	**4.4%**	**0.6%**	**-0.3%**

Source: R2006-1, USPS-T-8 at 6, 15

Figure 3 demonstrates that the declining economic role of mail is a long-standing trend. The number of First-Class Mail pieces per dollar of real GDP for First-Class Mail has been declining for more than two decades.

Figure 3. First Class Mail Pieces per $ Real GDP



Source: MPA et al.-LR-R2013-11/2, LR-2.xlsx, "Figures"

While the increase in the percentage of households with internet and broadband service has slowed as the market penetration has approached 100 percent, the intensity of Internet usage (not to mention the intensity of usage by handheld devices) has accelerated. Consider that at the beginning of 2007, there was no iPhone at all, let alone an iPhone 5; Apple introduced the first iPhone in June of that year. Similarly at the beginning of 2007, there was no Kindle, let alone a Kindle Fire; Amazon began selling Kindles in November of that year. No one had heard of an "app" in 2007; the app store didn't open until July 2008. Further, the April 2010 introduction of the iPad was still three years in the future. Today, 61 percent of Americans own Smartphones, and spend about an hour per day using them.[4] If you own a Smartphone yourself, you know that these statistics, if anything, understate the relationship between Americans and their phones. In 2007, Facebook and Twitter both existed, but neither had yet become the omnipresent social force that each is today. Facebook in 2007 had less than five percent of the number of active users that it has in 2013.[5] And Twitter users tweeted a total of 400,000 tweets *per quarter*, compared to 140 million tweets *per day* in March 2011 and 500 million tweets *per day* in 2013.[6] Given these revolutionary changes in American patterns of communication, the accelerated diversion of communications from the mail over this period is unsurprising.

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[4] http://abcnews.go.com/blogs/technology/2013/06/more-than-half-of-americans-own-smartphones/. http://www.zdnet.com/survey-says-americans-spend-58-minutes-a-day-on-their-smartphones-7000015980.

[5] http://news.yahoo.com/number-active-users-facebook-over-230449748.html.

[6] Wikipedia; https://blog.twitter.com/2013/new-tweets-per-second-record-and-how.

Of course, the relationship between these developments in electronic media and the use of mail is complex. That electronic channels provide alternatives to mail as a communications channel is indisputable, however. As a simple illustration, Table 3 shows the results of a search for apps for the iPhone, Android, and Blackberry platforms, using several different keywords that are relevant to the question. This table demonstrates that the introduction of smartphones and tablet apps have provided many new electronic alternatives to mail:

Table 3. Apps as Electronic Alternatives to Mail since 2007

Keyword	Substitute For:	No. of Apps			Illustrative Examples
		iPhone*	Android**	Black-berry***	
Mobile Banking	Bills and Payments	2200	250	100	Bank of America Chase Mobile
ECard	Correspondence	558	250	100	justWink American Greetings
Online Shopping	Standard Mail	347	250	100	Saviry Slickdeals
Newspaper	Periodicals	1672	250	86	NYTimes Wall Street Journal
Magazine	Periodicals	2200	250	100	Zinio Kindle
Social Networking	Correspondence/ Standard Mail	2200	250	100	Facebook Twitter LinkedIn

*Search appears to max out at 2200.

**Search appears to max out at 250.

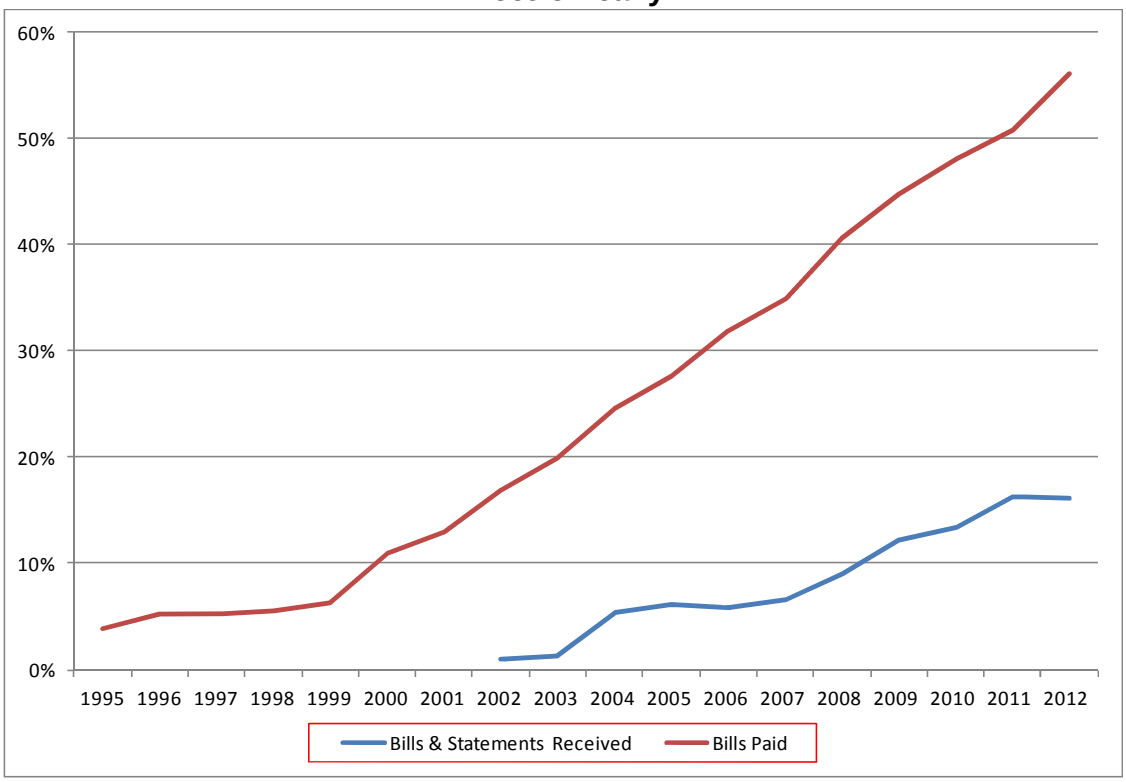
***Search appears to max out at 100.

My main point is not that these specific technologies by themselves fully explain the secular mail volume losses that have occurred since 2007; but rather that: (1) consumers in the United States have become much more comfortable

with digital technology since 2007; and (2) changes of this kind, unlike recessions, have significant secular effects.

Analysis of specific kinds of mail underscores the extent of the erosion of mail volume by electronic alternatives over the last few years. Consider, for example, the effect of electronic diversion on the use of First-Class Mail for bills, statements, and bill payments. The percentage of bills paid electronically increased from 35 to 56 percent from 2007 to 2012. And while the penetration of internet bill/statement presentment has lagged behind that of bill payment, the percent of bills/statements presented by internet has more than doubled since 2007.

Figure 4. Share of Bills & Statements Received by Internet and Paid Electronically



Source: MPA et al.-LR-R2013-11/2, LR-2.xlsx, "Figures"

It is important to note that, according to the Postal Service's Household Diary Study, the total number of bills paid by each household was essentially unchanged between FY 2007 to FY 2012, dropping by only one percent during this period. Thus, virtually all of the drop in these volumes is due to diversion, not to a decline in the total number of bills that households must pay each month.[7]

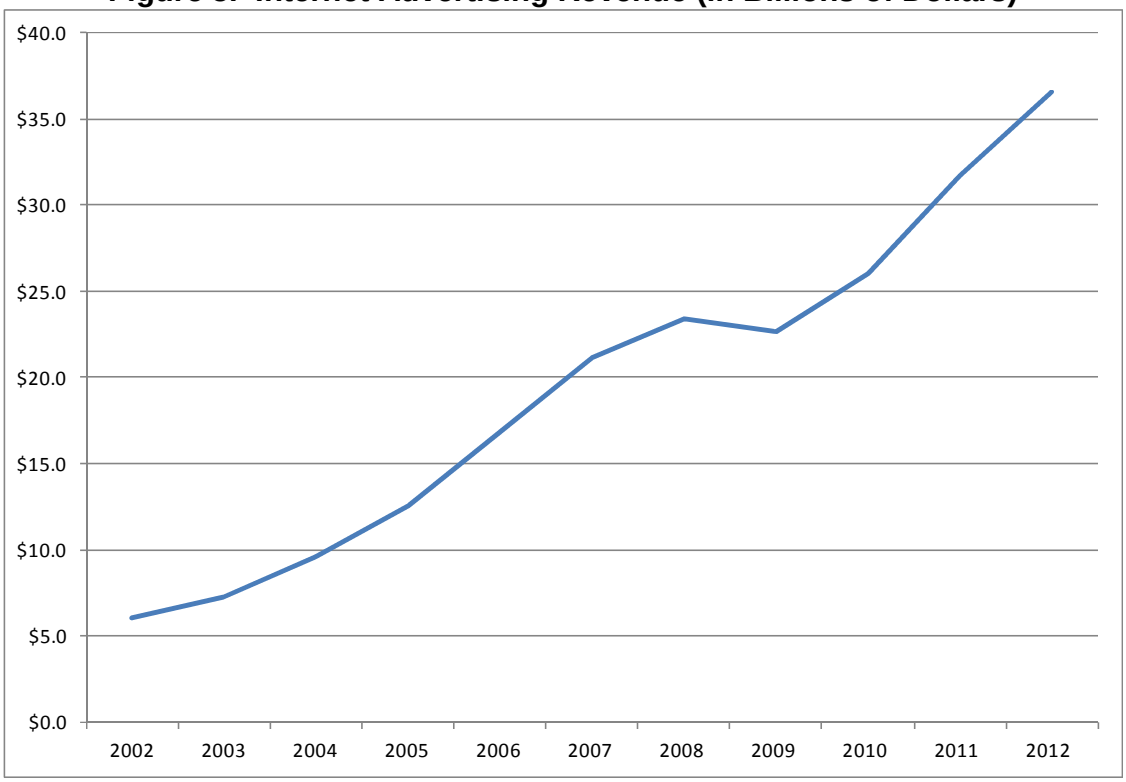
It also is not surprising that Internet advertising has eaten into direct mail's share of advertising spending. The Postal Service pointed this out in its FY 2012 Household Diary Study (at 39):

> However, the weak economic recovery led to only a small increase in total advertising spending. A large increase in Internet advertising left fewer funds available for more traditional advertising methods such as direct mail. As shown in Table 5.1, direct mail spending declined 5.9 percent compared to 2011; Internet advertising, on the other hand, increased 14.4 percent, by far the strongest spending growth compared to all other media categories.

Figure 5 shows that 2012 Internet advertising revenue was six times what it was in 2002. At approximately $37 billion in 2012 advertising revenue, the Internet is now a major competitor in the advertising marketplace.

[7] I understand that the Postal Service has pointed to a drop in the total number of loan *accounts*, particularly credit card ones, from FY 2007 to FY 2012 in support of its contention that declines in transaction volume are due to the recession. USPS Response to POIR No. 1, Question 9 (filed October 30, 2013). The data cited, however, are irrelevant. The key statistic in understanding the impact of the recession on transaction mail volumes is how many *bills* households pay each month and that number is essentially unchanged from FY 2007. The extent to which bills are presented or paid by mail and the frequency with which accounts are statemented, while important for understanding mail volume trends, are unrelated to the recession.

Figure 5. Internet Advertising Revenue (in Billions of Dollars)



Source: MPA et al.-LR-R2013-11/2, LR-2.xlsx, "Figures"

The growth in market share of advertising over the internet caused the Postal Service's direct mail market share to drop substantially. Specifically, Jon Swallen, Chief Research Officer of Kantar Media explained in his letter

> The aggregate percent change [in advertising] from 2007 to 2012 is a decline of 5.1 percent. This is likely an overstatement of how much total ad spending has actually declined. The reason is KMAI's limited tracking and reporting on online advertising.

Advertising spending on direct mail, on the other hand, declined by 23 percent, resulting in a drop in market share for direct mail of at least 19 percent: (100%-23%) / (100%-5%). Nickerson Response to POIR No. 6, Question 23.[8]

[8] In response to multiple information requests, e.g., Presiding Officer's Information Request 1, Question 9, Mr. Thress provides a table attempting to show that the Postal Service's problem in the advertising market is due to reductions in advertising spending, not market share losses. This claim is untrue

And the Postal Service's estimate of the impact of the recession on Standard Mail volume was even higher, 28.3 percent. MPA et al.-LR-R2013-11/2, LR-2.xlsx, "Volume & Economic Indicators". Obviously, a loss of market share to the internet or to any other medium cannot be ascribed to the recession.

Finally, the Postal Service's interpretation of trend variables beginning around the time of the recession as recession-related produces another nonsensical result: it leaves the Postal Service's demand equations without any variable at all that could capture the effect of natural changes in electronic diversion rates. This is because the Postal Service's current demand equations provide no way of estimating the effect of electronic diversion on mail volume *except through the very trend lines that are now being attributed to the recession*.

The history of the Postal Service's time series demand equations makes this clear. As explained in the Postal Service's Narrative Explanation of Econometric Demand Equations for Market Dominant Products *(*filed with the Postal Regulatory Commission on January 22, 2013), the Postal Service tried to capture the effects of electronic diversion in the early 2000s by including explicit measures of Internet usage in some of the demand equations. Narrative Explanation at 14. As electronic diversion continued, however—in the Postal Service's terms, moving from breadth of usage to depth of usage—the Internet-

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for the reasons discussed in the main text above. Additionally Mr. Thress's table calculates the Postal Service's share based only on spending on Standard Mail postage. A full understanding of the Postal Service's market share should take into account all direct mail, regardless of mail class, as well as the non-postage costs of direct mail advertising.

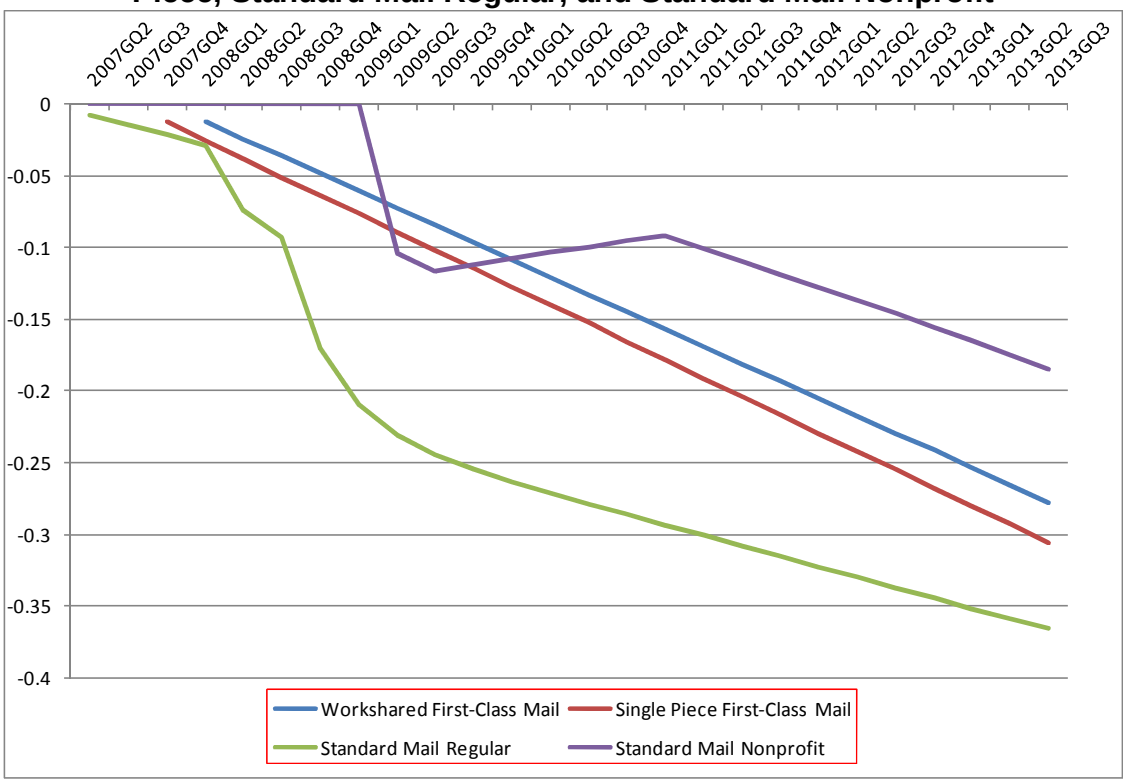
related measures became inadequate to explain the effects. As a result, the Postal Service replaced its explicit Internet variables with time trend variables as the Postal Service's preferred way to capture the nature of the effects of electronic diversion on the mail itself (*id*. at 15):

> For the demand equations for domestic mail, diversion is no longer modeled via explicit Internet variables, but, instead, is measured through a series of simple linear time trends which start at various times within the sample periods over which the Postal Service's demand equations are estimated.

Given the demand forecasting needs of the Postal Service, this is a plausible concession to the data in the absence of a good measure of the electronic diversion effect. In the present exigency case, however, the Postal Service has now *reclassified* trend variables beginning around the time of the recession as recession related rather than methods for capturing the deepening of electronic diversion. The effect of this reclassification is to leave the Postal Service's demand equations without *any* explanatory variables for the effects of the substantial recent electronic innovation on mail demand. Given the importance of recent electronic innovation to mail demand—which has been widely noted and acknowledged—this is a nonsensical outcome.

Figure 6 illustrates the absurdity of this result. The figure shows the graph of the time trends (attempting to reflect the acceleration of the diversion rate) for First-Class Workshared, First-Class Single Piece, Standard Mail Regular, and Standard Mail Nonprofit that the Postal Service attributes to the recession:

Figure 6. Diversion Trends for First-Class Workshared, First-Class Single Piece, Standard Mail Regular, and Standard Mail Nonprofit



Source: MPA et al.-LR-R2013-11/2, LR-2.xlsx, "Figures"

Nothing in the regression itself is able to identify that this trend is due to the recession rather than to other explanations. Indeed, the most natural interpretation is that the trend is due to the deepening of electronic diversion spurred by the recent technological developments of the past decade.

D. The Postal Service completely discounts all positive macroeconomic effects since FY 2007, effectively preventing the calculations from ever showing improvement due to economic recovery.

In response to POIR No. 3, Question 6, the Postal Service admitted that its estimates of the impact of the recession on mail volumes exclude any positive effects from the recovery. The Postal Service's mistake mathematically converts

cyclical volume losses to the recession into permanent recession-related losses. This omission is clearly incorrect. In recessions, macroeconomic indicators turn negative, but the overall economy, and thus macroeconomic indicators, recover in the post-recession period. By definition, the dating of a recession is associated with a contraction in economic activity associated with growing excess capacity, and the trough (which the NBER dates as having been reached in June of 2009[9]) marks a period of increasing activity and reductions in excess capacity. The recovery period is an integral part of the business cycle; the Postal Service's model simply assumes it away.

E. In addition to the above problems of interpretation, the Postal Service demand equations have two other major flaws.

The Postal Service's time series model has two further flaws. First, as described in the Postal Service's response to Presiding Officer's Information Request No. 3, question 7 (November 1, 2013), the Postal Service undertakes an extensive process to choose the macroeconomic and trend variables that are used in its demand equations. The trend variables, in particular, are selected through an iterative process using regression residuals to choose possible trend start dates, functional forms, and optimization procedures. *See, e.g.,* Thress Response to POIR NO. 2, Question 6 (filed October 30, 2013). As a result of these extensive explorations, the measures of statistical fit are no longer strictly correct, and the model results need to be interpreted with substantial caution because the standard errors are not as tight as they appear and the choice between included and excluded variables is hidden. The proper test statistics

[9] See http://www.nber.org/cycles.html.

after such an exploration would have to reflect the many different candidate specifications that were considered but not shown.[10]

In particular, the modeled results do not provide statistical tests showing that the trends included—which start on a particular date and have a particular form—are significantly different in their statistical fit from other trends that could have been included instead. For example, in comparing the demand equations filed in the current case with those filed in January 2013—less than a year earlier—there are shifts in the trend variables for the major subclasses of mail. For Single-Piece First-Class Mail, for example, the trend starting in 2002Q4 was previously a trend starting in 2004Q2; for Workshared First-Class Mail, the three trends starting in 2002Q3, 2004Q1, and 2008Q1 were previously two trends starting in 2002Q2 and 2008Q3; and for Standard Regular, the trend starting in 2007Q1 was previously two trends starting in 2006Q1 and 2012Q3. Thress Response to POIR No. 6, Question 12. These shifts in specification with the addition of only three quarters of extra data illustrate the instability and uncertainty in the definitions of the trend variables.

Second, separate from the issue raised above concerning the particular choice of explanatory variables employed, time-series regressions of mail volume as the variable to be explained are fraught with econometric issues because of the trends the regressions reflect. This is true even when the mail volumes are transformed into logarithms, as is done by Thress. As pointed out by the Postal

[10] For example, see Leamer, Edward E. "Sensitivity Analyses Would Help." *American Economic Review*, June 1985, 57(3), pp. 308-13.

Service's Office of Inspector General, the current statistical specification for mail demand data used by USPS presumes that the volume data are stationary—that is, that they reflect no larger trends. The OIG report notes the standard unit root tests that clearly show that the mail volume series do exhibit trends.[11]

Regressions conducted with non-stationary data can yield so-called 'spurious' regression results because the trends reflected in the data can be linked to any trends in any other data series.[12] The accepted way to avoid this problem is to look at changes in the data over time, for example by looking at the rate of growth in mail volume rather than mail volumes themselves.[13] An exploration of the implications for growth rates plays a role even in sophisticated statistical techniques, such as the error-correction models used in the OIG analyses. Failure to follow these safeguards can produce spurious estimates of

[11] *See* pages 12-23 of Appendix to United States Postal Service Office of Inspector General. Analysis of Postal Price Elasticities. May 1, 2013. Report Number: RARC-WP-13-008.

[12] This issue is demonstrated with simulated data in the seminal econometric work by Granger and Newbold (1974). Spurious regressions in econometrics. *Journal of Econometrics* 2, 111-120.

[13] The importance of the spurious regression problem coupled with the fact that time-series macroeconomic and financial data often exhibit non-stationary patterns led to the development of a number of studies on the topic. Granger and Newbold demonstrate the advantages of using differenced data. Plosser and Schwert (1978) [Money, Income, and Sunspots: Measuring Econometric Relationships and the Effects of Differencing. Journal of Monetary Economics 4, 637-660], among many, many others, also discuss the benefits of using differenced data. They employ a standard macroeconomic model as a laboratory to explore the econometric issue; they conclude the following: "We argue that the problem of non-stationary disturbances (possibly in the levels regression) are far more serious than the problems caused by excessive differencing … In the under-differencing case, where disturbances are non-stationary, regression parameter estimators do not have moments and may be inconsistent. On the other hand, in the over-differencing case, regression parameter estimators are unbiased and consistent, although they are not as efficient as the estimators for the correctly specified model."

statistically significant coefficients among trending variables without any actual economic link among them.

In the present case, this issue is particularly challenging for two reasons. First, as has been argued, the electronic diversion question raised above also seems best represented by a secular trend (in an ideal world, whatever observable variables that would capture this are likely non-stationary). Second, any joint exploration of mail volume, electronic diversion, and business cycles requires a careful modeling of joint relationships that span both trend and growth rate dimensions: business cycles are, *by definition*, cyclical phenomena that generate deviations around a lower frequency economic trend. A more sophisticated error-correction method would be required to first capture the links between electronic diversion and the trend in volume, after which one could uncover the role macro variables play in describing cyclical deviations in volume growth surrounding this trending relationship. Without these steps, a time series analysis can reveal little about the role the macro economy plays in determining mail volume under the current specifications employed.[14]

[14] In response to Presiding Officer's Information Request No. 4, Question 4(a), Mr. Thress asserted that, because some of his data are already stationary, first-differencing of the data would reduce the accuracy and stability of the econometric estimates, and that even more sophisticated error correction models would produce larger error terms. Mr. Thress is mistaken on several levels.

First, the data are not stationary, so one must either take a difference, very carefully de-trend all the series, or run a much more sophisticated model that has co-integration. The first reaction of a responsible econometrician to an R^2 of 0.99 is not to assume that one has found an amazingly good fit, but to assume that the results are symptoms of a statistical problem. Spurious regressions like those discussed above in the text yield huge but incorrect R^2 values. To reject differencing or a more sophisticated error control model because the result would be lower indicated R^2 values misreads the problem: the lower R^2 values reflect the reality that one has arrived closer to the truth. The better-specified equations can still detect relationships—my differenced exposure

IV. The Postal Service assigns all negative macroeconomic effects since FY 2007 to the 2007-2009 recession, even though some of these macroeconomic effects reflect long-standing trends that were well-established before the recession.

While the economy has recovered in overall growth terms and the current Postal Service demand equations provide no role for such a recovery, it is true that a significant level of excess capacity in the economy remains. Measures of output or employment growth will show a positive growth rate post-recession, but it has been the case that these levels of growth have been insufficient to close the gap between where we are and where we could be if we were fully utilizing all of our available resources. Measures like the *employment* and *output* gap are designed to capture this more subtle feature of the data. Specifically, the unemployment gap (the unemployment rate less an estimate of full employment) and the output gap (the percentage difference between the actual level of GDP and a measure of the level of potential GDP) are designed to reflect the amount of excess capacity in the economy). While the slowness of this recovery is a

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coefficients are still significant—but one can never explain 99 percent of the variability of a series like this. Realistic time series models of this kind *should* be noisy; that is just the reality of the world.

Second, one does need to test and likely correct *all* the data—including the explanatory variables. It is well known that the levels series of macroeconomic data must either be differenced or have a cyclical component extracted another way (e.g., with the Hodrick Prescott filter, where the analyst focuses on the cyclical part of the data). One simply must be more careful than this.

Finally, and in any event, even if one naively runs a regression like this, one cannot argue that "low-frequency" (meaning slow moving) or trending relationships are about the recession and the macroeconomy without a much deeper model that explains the economics and predicts exactly what relationships to test. That would likely require a sophisticated error correction model far more sophisticated than Mr. Thress's approach. That brings us back to the main problem with his analysis. For all of the reasons explained in the main text of my statement, one cannot ascribe his trend and intervention variables to the business cycle.

serious issue for policy makers, it does not explain the sizeable declines in mail volume described in the Thress report. That is, the output gap and employment gap currently are about 2-3 percent, an order of magnitude smaller than the Postal Service's estimate of recession-related volume losses. Indeed, I will demonstrate the relatively tight link between these measures and measures that are already featured in the Postal Service's demand equations.

For Single-Piece First-Class Mail, the Postal Service demand equation uses the trend component of employment as the only macroeconomic variable. However, by construction, the effect of trend variables has a very similar effect before, during, and after the recession. There is a strong argument for omitting the effect of trend variables like this completely in the Postal Service's accounting for the effects of the recession, since the variable was created to focus specifically on long-term rather than cyclical effects.

Macroeconomic variables such as GDP, employment, or investment are associated with two important components. Their levels incorporate a long-run dynamic that reflects evolving low-frequency effects associated with labor force growth, capital stock growth, and the productivity with which the economy employs these resources. The level of these series also reflects cyclical variation around these trends as economies experience booms and busts. The popular Hodrick-Prescott filter used by Mr. Thress is a common technique that often complements growth rate analysis that is designed to extract these two components: the trend and the cyclical. Both components are interesting to economists, but a recession is largely about the latter.

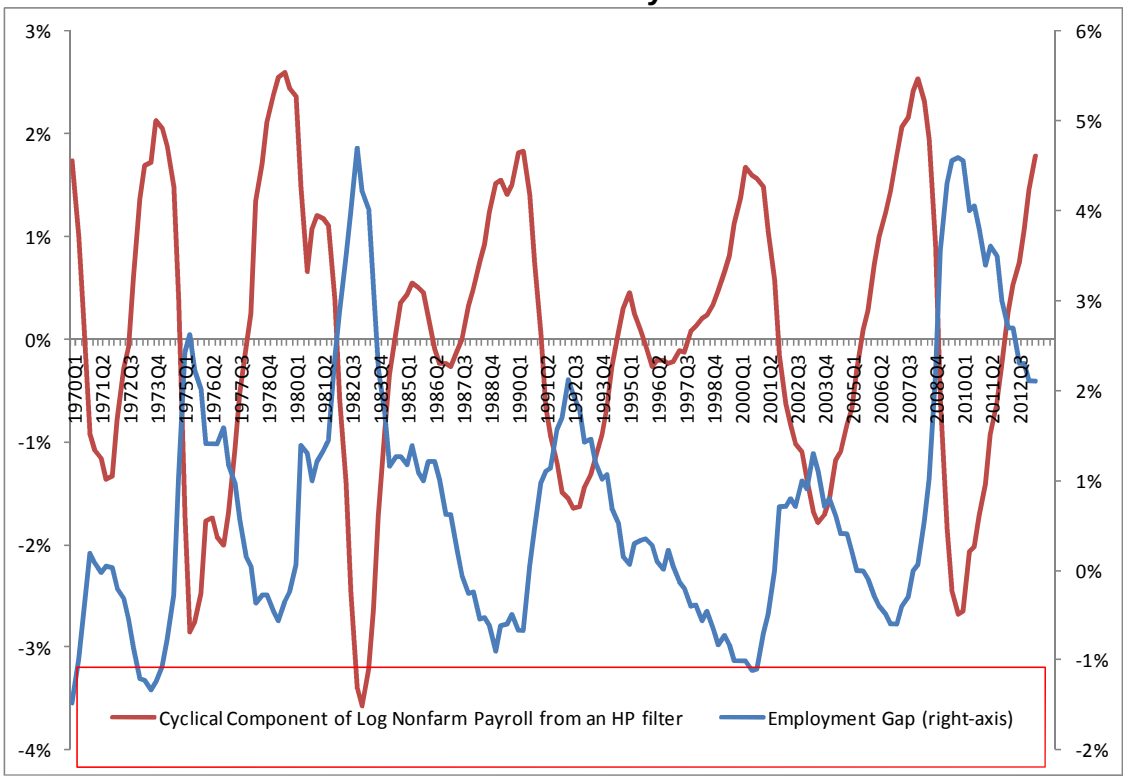
The Postal Service has argued that the lingering effects of the 2007-2009 recession on employment and output justify attributing the effects of long-term trends in employment on Single-Piece First-Class Mail volume to the recession as well. To the extent that that argument has any merit, it would imply only that the *recent change* in the effect of the employment trend variable on Single-Piece First-Class Mail volume would be related to the recession. It is unclear that the Postal Service's regressions can be used to identify a statistically significant change from the small number of years available. However, even if the point estimates are taken at face value, then the employment trend variable is associated with an average decline of 348 million single-piece letters per year during the 2002-2007 pre-recessionary period, compared to an average decline of 435 million pieces per year during the 2008-2012 period.[15] The difference—the heightened and, according to the Postal Service's theory, recession-related, decline of 87 million pieces per year during the 2008-2012 period—is only twenty percent of the total impact. Nonsensically, the Postal Service attributes the entire decline during the 2008-2012 period—435 million pieces per year on average—to the effects of the recession, despite the fact that this decline is only modestly greater than the 2002-2007 average pre-recession decline of 348 million pieces per year.

Additionally, the Postal Service's citation to the lingering effect of the recession on employment and output – as illustrated by the output gap – in

[15] USPS-R2010-4R/10, ExigentImpact.xlsx, "Volume," cells D5:D15. Furthermore, the average decline associated with this variable for the 2008-2014 period is 277 million pieces per year, 71 million *less* than during the 2002-2007 period. POIR.6.Q.14.Rev.11.15.ExigentImpact.xlsx, "Volume," cells D5:D17.

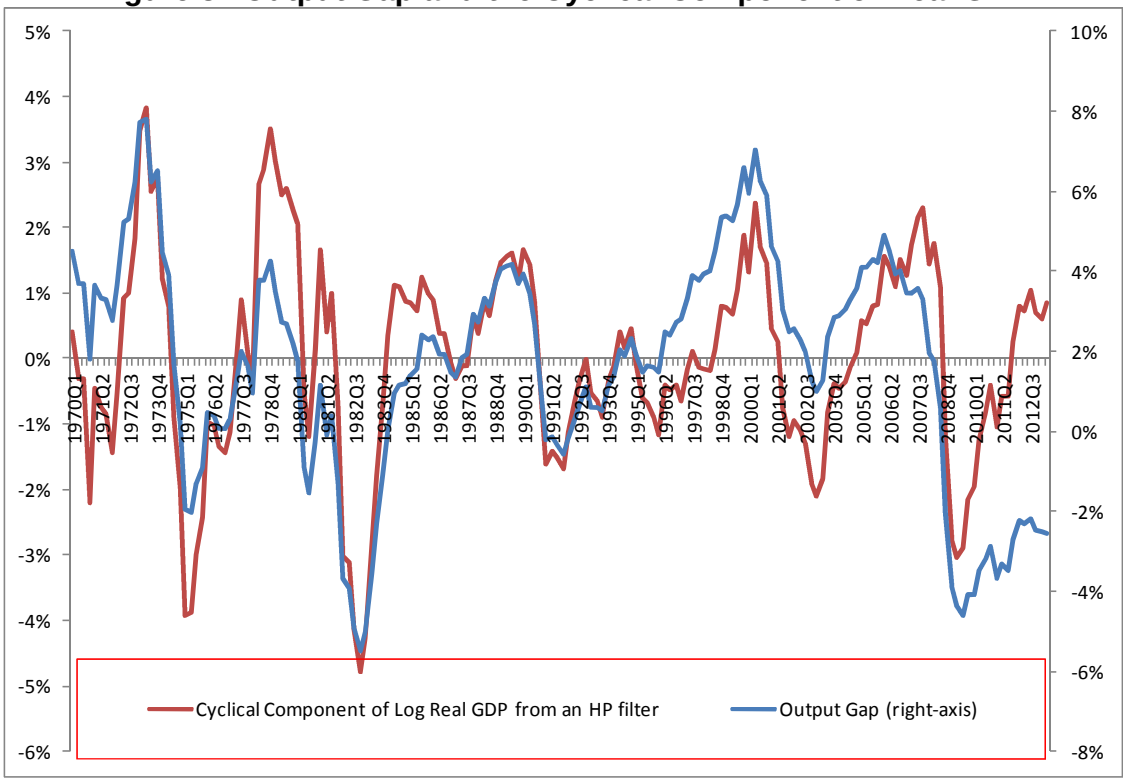
support of its large (25.6 percent in FY 2012) and growing mail volume loss estimates should be given little weight. Thress Response to POIR No. 1, Question 6. Indeed, the cyclical components in the nonfarm payroll and GDP series from a common Hodrick-Prescott filter already capture much of the employment and output gaps, as illustrated in Figures 7 and 8, respectively.

Figure 7. Employment Gap and the Cyclical Component of Non-Farm Payroll



Source: MPA et al.-LR-R2013-11/3, LR-3.xlsx, "Figures"

Figure 8. Output Gap and the Cyclical Component of Real GDP



Source: MPA et al.-LR-R2013-11/3, LR-3.xlsx, "Figures"

These figures show that the degree of correlation between the amount of excess capacity in the economy – as measured by the employment and output gaps – and the cyclical components of these relevant macro indicators that are already used in the current version of the Postal Service demand equations are extremely high. These are largely the same economic quantities.

The slow recovery in the U.S. economy, while frustrating to policy makers, is a feature that is already reflected in the series that are currently being employed in USPS demand equations. While the measures of excess capacity in the economy – output and employment gap – have not recovered as rapidly as some other macroeconomic indicators, these series too show recovery from their

2009 troughs; there is no evidence to support a long-run trend effect. Collectively, there is little evidence that the slow moving nature of this recovery can explain the sizeable declines – 25.6 percent in FY 2012 and growing -- in mail volumes proffered by the Postal Service.

V. Several exploratory analyses, using more standard macroeconomic approaches, show that the effects of the 2007-2009 recession on mail volume are smaller by an order of magnitude than the Postal Service has estimated.

Constructing a far more sophisticated volume (demand) specification that incorporates all the joint relationship between mail volume, price elasticities, electronic diversion, and cyclical dynamics would be extremely difficult, given the lack of clear data on electronic diversion. The Commission need not build such a model, however. One may evaluate the reasonableness of the demand equations using easy to digest exploratory analyses of the relationship between the growth rate in mail volume and the growth rate of several macroeconomic variables by conducting simple regressions of the *percentage change* in mail volume on *percentage changes* in several broad macro aggregates. Crucially, a regression of growth rates on growth rates will avoid the problem of producing spurious estimates from trend variables.

This simple setup is a well-established technique used in macroeconomics and finance for estimating the extent to which the earnings of an enterprise are exposed to the risk of potential macroeconomic events. For example, this basic approach is frequently used to estimate a firm's business risk exposure to the macro economy. Such regressions are widely used and represent the generally

accepted approach for dealing with the challenges posed by time series data of this type.[16] Growth-rate-on-growth-rate regressions of this kind are simple, but quite standard exercises designed to determine the effects of macroeconomic events.

In this spirit, I conducted two sets of growth-rate-on-growth-rate regressions to provide a range of plausible estimates of the approximate impact of the recession on the three largest categories of mail. The variables to be explained are quarterly observations from January of 1970 to June of 2013 in the year-on-year growth rates in mail volume (excluding parcels) for First-Class Mail and Standard Mail.[17] Year-on-year growth rates are common when seasonality is an issue, as it is for mail volume; however, one could just as easily explore such relationships with simple quarter-on-quarter growth rates. The explanatory variables are, separately, quarterly observations in year-on-year growth in real GDP, non-farm payroll employment, real retail sales, and real private domestic investment. The four variables are standard representations of the macro

[16] For an example of estimating risk exposures, both equity market and macroeconomic, using percentage changes in relevant series as both independent and dependent variables, see sections 13.1 and 13.2 of Bodie, Kane and Marcus, *Investments* (9th ed. 1995), at sections 13.1 and 13.2). (This is the standard textbook use in most MBA finance classes.) Chen, Roll and Ross ("Economic Forces and the Stock Market," *Journal of Business* 59 (1986) provides a good example of how to estimate macro exposures with percentage change data.

[17] The analysis follows the data provided by the Postal Service in USPS-R20104/9. For First-Class Mail – both Single Piece and Workshared – only letters, cards, and flats are included. For Standard Regular, parcels are specifically excluded. For the other three types of Standard (Standard ECR, Standard Nonprofit, and Standard Nonprofit ECR) it is not clear from the *Further Statement of Thomas E. Thress* whether parcels are excluded or not, but in any case the role of parcels in these categories should be negligible.

economy and there is no a priori or theoretical reason to believe that any particular one provides a "better" high level explanation of the relationship of mail to the macro economy; all the variables appear at various levels in the existing Postal Service demand equations. The data are all taken from the St. Louis Federal Data Depository, with relevant internet links provided in the library reference MPA et al.-LR-R2013-11/3, LR-3.xlsx. There are eight regressions in total – two measures of the percentage change in mail volume and four measures of the change in macroeconomic conditions. For each regression, the library reference provides the relevant coefficient estimating the impact of the macroeconomic variable – the exposure – from a growth rate on growth rate regression. In addition, the library reference includes a standard error (in italics) for each coefficient that corrects for any heteroskedasticity and serial correlation in the regression error structure, as well as an adjusted R-squared.[18]

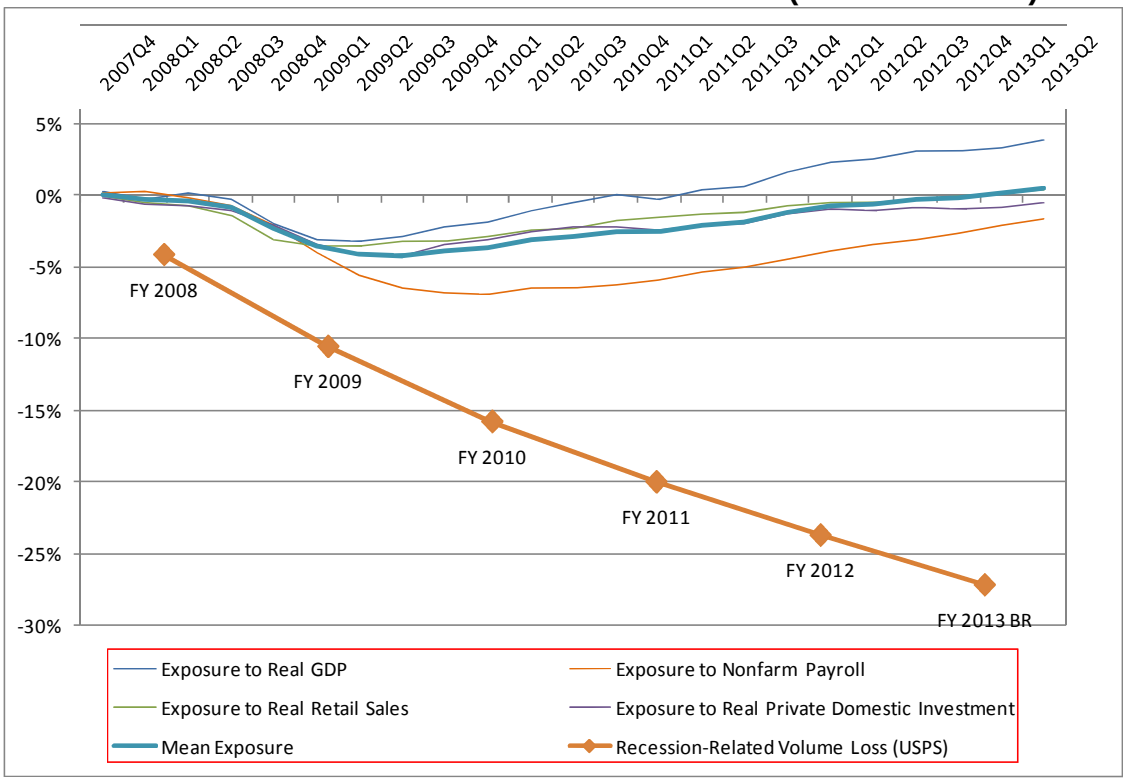
It is clear from these exploratory regressions that USPS mail volume over the last several decades is indeed affected by macroeconomic fluctuations, as would be expected for any business. The regression coefficients demonstrate that in some cases the exposure coefficient can be above one—which means, in those cases, that on average the percentage change in mail volume moves more than one-for-one with percentage changes in the relevant macroeconomic variable. This is particularly true for Standard Mail, which reflects the cyclical nature of advertising.

[18] The regressions were performed using Eviews. These simple regressions, with a single explanatory variable, could be carried out in any standard statistical software.

Using these simple growth rate regressions, I analyzed the cumulative effect beginning in the fourth quarter of calendar year (CY) 2007 (the outset of the recession according to the NBER) to the present on the three groups of mail volume. Multiplying (1) the quarterly growth rates in each of the four macroeconomic aggregates by (2) the regression coefficients that describe the macroeconomic exposure of each volume growth rate yielded an estimate of the expected macro effect on mail volume for each type and each macro variable for that quarter. I then cumulated these expected macro effects from CY 2007, Q4 through CY 2013, Q2 to demonstrate what the typical business exposure for various categories of mail volume coupled with the particular business cycle dynamic over the post-2007 period would imply for the expected cumulative macro related component of mail volume. While the results are exploratory in nature, estimating these cumulative effects across several measures of mail volume and several macroeconomic variables allows for a range of plausible estimates.

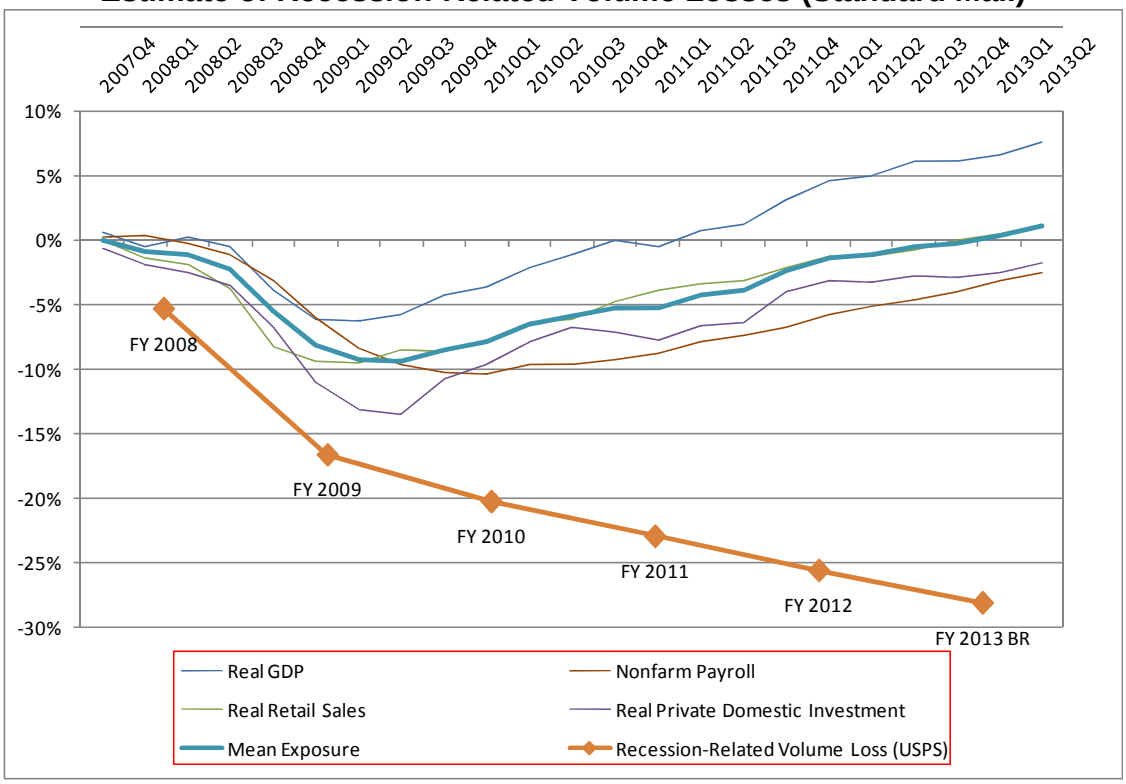
Figures 9 and 10 graph the cumulative effect of the recession across the four different candidate macroeconomic variables for First-Class Mail and Standard Mail, respectively. For comparison, the figures each include the Postal Service's estimate of recession-related volume losses for the same class of mail.

Figure 9. Comparison of Risk Exposure From Recession With USPS-Estimate of Recession-Related Volume Losses (First-Class Mail)



Source: MPA et al.-LR-R2013-11/3, LR-3.xlsx, "Figures"

Figure 10. Comparison of Risk Exposure From Recession With USPS-Estimate of Recession-Related Volume Losses (Standard Mail)



Source: MPA et al.-LR-R2013-11/3, LR-3.xlsx, "Figures"

First, the effect, in all cases, reaches a trough in 2009-2010 as the economy begins to recover. Indeed, in some cases, the *cumulative* macro effect on mail volume growth implied by the coupling of these long-run relationship with the evolution of the macroeconomic indicators from 2007 returns to a positive number in more recent years. While the overall deepest troughs in cumulative mail volume do vary somewhat across the two classes of mail and the four candidate macroeconomic explanatory variables, in no case does one observe the much larger secular declines claimed by Mr. Thress. Even the deeper implied troughs for Standard Mail, a volume series that exhibits a larger degree of macroeconomic exposure measured in this way, are largely or entirely reversed over the next several years as the macro economy recovers.

VI. Consistent with the exploratory analyses, a corrected interpretation of the Postal Service's flawed demand equations shows a dramatically reduced estimate of the loss in mail volume and contribution due to the recession.

The critiques above argue for a substantial reinterpretation of the Postal Service demand equations. Section III.A through III.C show that the time trends included in the demand equations are far more likely to be related to long-term trends towards electronic diversion than to the recession. Section III.D explains that the positive effects of economic recovery should be reflected in the calculation of the impact of the recession. Section III.E identifies two other major flaws in the Postal Service's demand equations. Finally, Section IV indicates that the impact of the trend component of macroeconomic variables should be excluded from the impact of the recession.

To provide a more appropriate estimate of the recession-related mail volume impacts based upon the Postal Service demand equations, I asked SLS Consulting, Inc., to generate versions of the Postal Service library references that reflect these three changes in interpretation and only treat the impact of Hodrick-Prescott *cyclical* components as recession-related, as I view the Hodrick-Prescott trend components as determined by unrelated, slow moving effects associated with labor force growth and productivity and the simple time trends as entirely unrelated to the recession.

Some of the Postal Service's demand equations include raw macroeconomic variables, *e.g.*, the investment variable used in the Standard Mail Regular and Enhanced Carrier Route equations, which incorporate both cyclical and trend effects. These specifications are inappropriate for identifying

the effect of a recession on mail volumes. The Postal Service should have disaggregated these variables into their cyclical and trend components, and treated only the cyclical component as recession-related. However, lacking more appropriate specifications, SLS Consulting, Inc. incorporated the effects of these raw macroeconomic variables on mail volume as well. In this way, the estimates presented below are likely upper-bound impact estimates.

The library reference (MPA et al.-LR-R2013-11/1) implementing these calculations include alternate versions of USPS-R2010-4/10, Exigent Impact.xlsx and USPS-R2010-4R/11, R2010.4R.11.Contribution.Calculation.xlsx. Table 4 below identifies the variables treated as recession-related and contrasts them with the variables identified by Thress as such.

Table 4. Factors Classified as Recession-Related

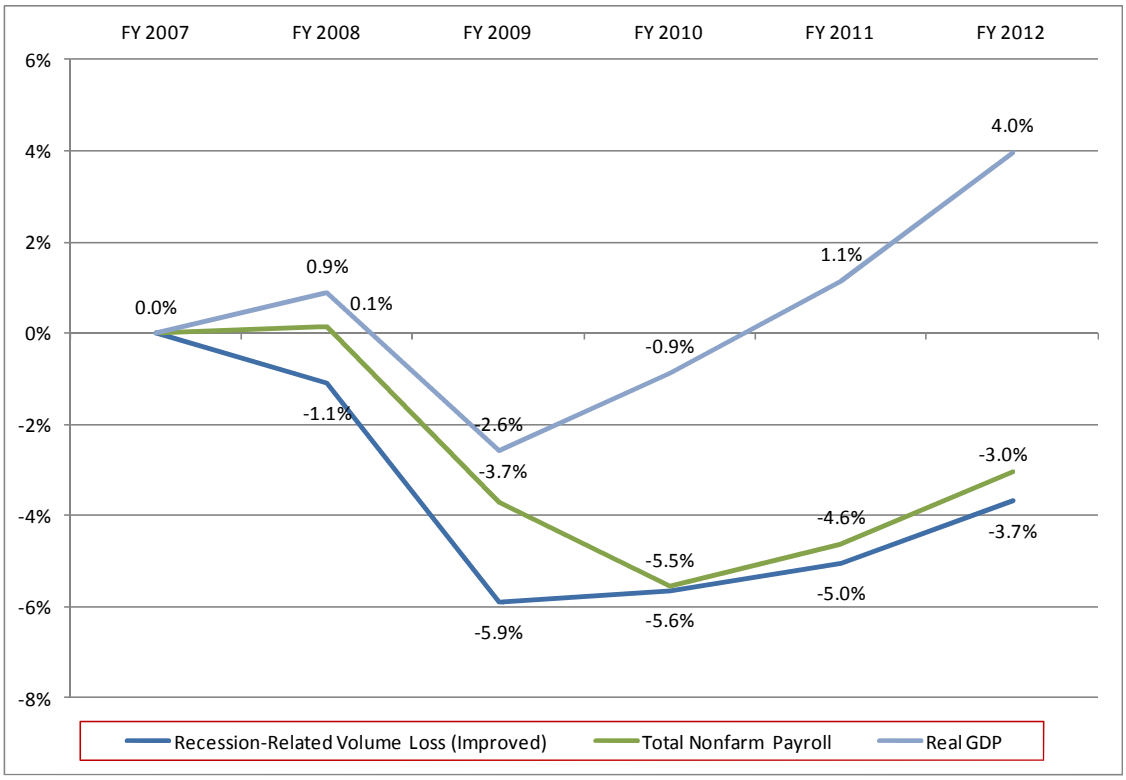
Product	Variables Classified as Recession-Related	
	USPS	**Improved**
First-Class Single-Piece Letters, Cards, and Flats	• Trend Component of Employment • Diversion Trend starting in 2007Q4	• None
First-Class Workshared Letters, Cards, and Flats	• Cyclical Component of Employment • Diversion Trend starting in 2008Q1	• Cyclical Component of Employment
Standard Regular Mail	• Investment • Non-Linear Intervention variable starting in 2008Q2 • Negative Trend starting in 2007Q1	• Investment
Standard ECR Mail	• Investment	• Investment
Standard Nonprofit Mail	• Trend Component of Investment • Non-Linear Intervention variable starting in 2009Q2 • Negative Trend starting in 2011 Q2	• None
Standard Nonprofit ECR Mail	• Cyclical Component of	• Cyclical Component of

	Investment	Investment
Periodicals	• Trend and Cyclical Employment • Negative Trends starting in 2008Q1 and 2011Q1	• Trend and Cyclical Employment*
BPM	• Mail Order Retail Sales • Negative Trend starting in 2008Q3	• Mail Order Retail Sales
Media & Library Rate Mail	• Mail Order Retail Sales • Negative Trend starting in 2009Q4	• Mail Order Retail Sales

*Because USPS-R2010-4R/10 does not separately present the contributions of Trend and Cyclical Employment variables on Periodicals mail volume, the SLS Consulting estimate includes both.

Figure 11 below shows the percentage volume losses that are more reasonably classified as recession-related. As the Figure shows, the mail volume losses due to the recession peaked at six percent and have recovered to 3.7 percent in FY 2012. Not only are these based upon an improved interpretation of the Postal Service's demand equations, the mail volume loss curves – both in terms of magnitude and shape – are much more in line with other macroeconomic indicators.

Figure 11. Cumulative Percent Change in Market Dominant Mail Volume and Macroeconomic Variables From FY 2007

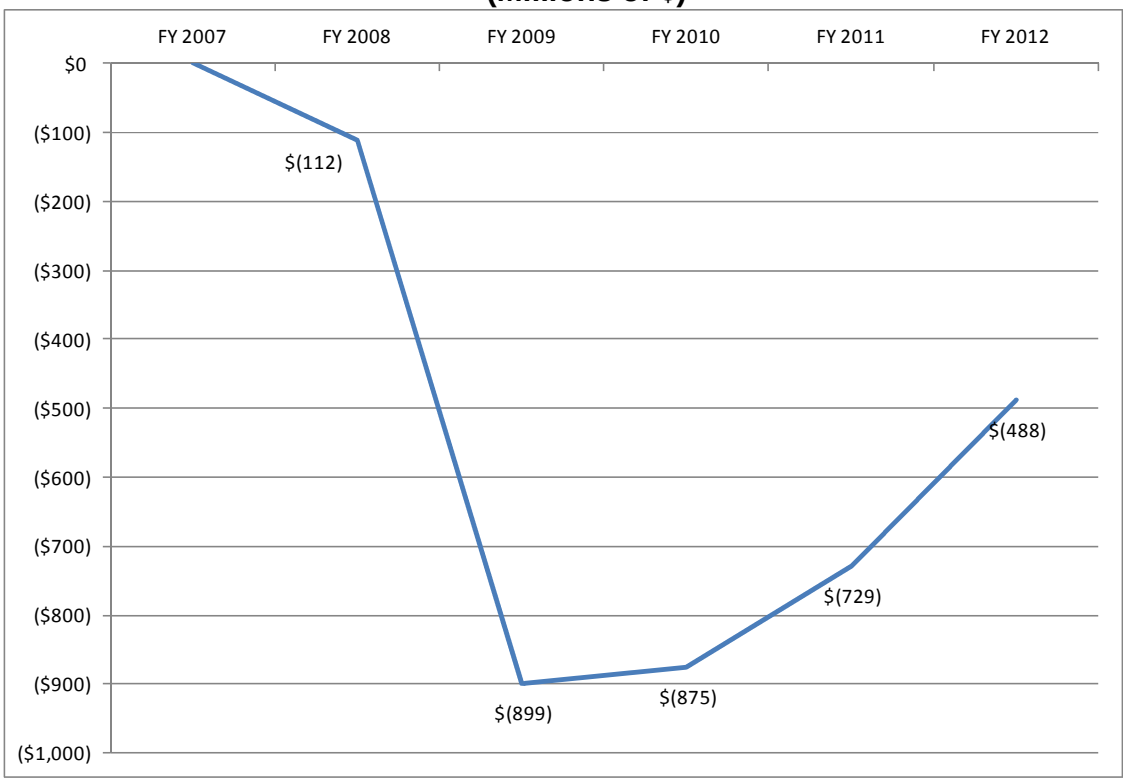


Source: MPA et al.-LR-R2013-11/2, LR-2.xlsx, "Figures"

The size of the mail volume changes implied by this reinterpretation of the Postal Service's demand equations is substantially smaller than the estimates provided by witness Thress and is also similar in magnitude to the results implied by the exploratory analyses described in Section V.

Figure 12 shows total contribution losses by year associated with the mail volume losses shown above. The impact of the recession on USPS contribution unsurprisingly peaked in FY 2009 at $899 million and has recovered since then, to $488 million in FY 2012, and is expected projected to decrease further: to approximately $400 million in FY 2013 and $300 million in FY 2014. MPA et al.LR-R2013-11/2, LR-2.xlsx, "Volume & Economic Indicators."

Figure 12. Recession-Related Contribution Loss (Improved)
(Millions of $)



Source: MPA et al.-LR-R2013-11/2, LR-2.xlsx, "Figures"

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Nominated for Kelley School of Business teaching award, 2005

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FLAS fellowship, 1996-1999

Phi Beta Kappa, 1994

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"How Do Foreign Investors Impact Domestic Economic Activity? Evidence from China and India" with Tarun Ramadorai and Pab Jotikasthira, 2013. Journal of International Money and Finance, forthcoming.

"Asset Fire Sales and Purchases and the International Transmission of Financial Shocks," with Tarun Ramadorai and Pab Jotikasthira, Journal of Finance, 2012, 67, 2015-2050.

"Regulatory Pressure and Fire Sales in the Corporate Bond Market," with Andrew Ellul and Pab Jotikasthira, Journal of Financial Economics, 2011, 101, 596-620.

"What Segments Equity Markets?," with Geert Bekaert, Campbell R. Harvey, and Stephan Siegel, Review of Financial Studies, 2011, 24, 3841-3890 (lead article).

"Financial Openness and Productivity," with Geert Bekaert and Campbell R. Harvey, World Development, 2011, 39, 1-19 (lead article).

"Liquidity and Expected Returns: Lessons from Emerging Markets," with Geert Bekaert and Campbell R. Harvey, Review of Financial Studies, 2007, 20, 1783-1831.

"The Risk Return Tradeoff in the Long Run: 1836-2003," Journal of Financial Economics, 2007, 85, 123-150.

"Global Growth Opportunities and Market Integration," with Geert Bekaert, Campbell R. Harvey, and Stephan Siegel, Journal of Finance, 2007, 62, 1081-1137.

"Growth Volatility and Equity Market Liberalization," with Geert Bekaert and Campbell R. Harvey, Journal of International Money and Finance, 2006, 25, 370-403.

"Consumption, Dividends, and the Cross-Section of Equity Returns," with Ravi Bansal and Robert Dittmar, Journal of Finance, 2005, 60, 1639-1672.
Honorable mention, Smith-Breeden Distinguished Paper Award.

"Does Financial Liberalization Spur Growth," with Geert Bekaert and Campbell R. Harvey, Journal of Financial Economics, 2005, 77, 3-55 (lead article).

"Equity Market Liberalization in Emerging Markets," with Geert Bekaert and Campbell R. Harvey, Journal of Financial Research 2003 (Fall). Also published in The Federal Reserve Bank of St. Louis Review, July/August 2003, Volume 85, Number 4.

"Market Efficiency, Fundamental Values, and the Risk Premium in Global Equity Markets," with Ravi Bansal, Journal of Econometrics, 2002, 109, 195-237 (lead article).

"Emerging Equity Markets and Economic Development," with Geert Bekaert and Campbell R. Harvey. Journal of Development Economics, 2001, 66, 465-504.

OTHER PUBLICATIONS:

"The U.S. Economic Crisis: Root Causes and the Road to Recovery," with Greg Brown. Journal of Accountancy, 2009, 208, 42-49

"Behind the Boom: The Risks of Emerging Markets," Canadian Investment Review, 2007, 20, 22-26.

"Brazil in Crisis," with Campbell R. Harvey and Diego Valderrama, Emerging Markets Quarterly, 1999, Spring, 4-9.

BOOK CHAPTERS:

"Financial Openness and the Chinese Growth Experience," with Geert Bekaert and Campbell R. Harvey, in China's Financial Transition at a Crossroads, 2007, Charles Calomiris (ed.), Columbia University Press.

WORKING PAPERS:

"Why do Term Structures in Different Countries Co-Move?," with Pab Jotikasthira and Anh Le, 2013. (R&R, Journal of Financial Economics)

"Is Historical Cost Accounting a Panacea? Market Stress, Incentive Distortions, and Gains Trading," with Andrew Ellul, Pab Jotikasthira, and Yihui Wang, 2013. (R&R, Journal of Finance)

"Political Risk Spreads," with Geert Bekaert, Campbell R. Harvey, and Stephan Siegel, 2013. (R&R, Journal of International Business Studies)

"Mark-to-Market Accounting and Systemic Risk in the Financial Sector," with Andrew Ellul, Pab Jotikasthira, and Yihui Wang, 2013. (solicited for the 58 Economic Policy Panel for the journal Economic Policy)

"Endogenous Liquidity Supply," with Ravi Bansal and Wilbur John Coleman, 2011.

"Interpreting Risk Premia Across Size, Value, and Industry Portfolios," with Ravi Bansal and Robert Dittmar, 2003.

PRACTIONER PRESENTATIONS:
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"Emerging Markets", panelist
Global Investment Conference, 2007
"Liquidity Risk in Emerging Markets"

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"Consumption, Dividends, and the Cross-Section of Equity Returns," 2001
"Interpreting Risk Premia across Size, Value and Industry Portfolios," 2003
"Financial Openness and the Chinese Growth Experience," 2006
"Liquidity and Financial Intermediation", 2009
"Regulatory Pressure and Fire Sales in the Corporate Bond Market", 2009
"Why do Term Structures in Different Countries Co-Move?," 2010

Western Finance Association:
"Market Efficiency, Fundamental Values, and the Risk Premium in Global Equity Markets," 2000
"Emerging Equity Markets and Economic Development," 2001
"Consumption, Dividends, and the Cross-Section of Equity Returns," 2002
"Growth Volatility and Equity Market Liberalization," 2003
"Global Growth Opportunities and Market Integration," 2005
"Why do Term Structures in Different Countries Co-Move?," 2011
"Endogenous Liquidity Supply" 2011
"Is Historical Cost Accounting a Panacea? Market Stress, Incentive Distortions, and Gains Trading," 2013

American Finance Association:
"Emerging Equity Markets and Economic Development," 2001
"Does Financial Liberalization Spur Growth?" 2002
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"What Segments Equity Markets?" 2009
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"Asset Fire Sales and Purchases and the International Transmission of Financial Shocks" 2011
"Endogenous Liquidity Supply" 2011
"The European Union, the Euro, and Equity Market Integration" 2012
"Political Risk and International Valuation" 2013

American Economic Association:
"What Segments Equity Markets?" 2007

Econometric Society:
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Utah Winter Finance Meetings:
"Consumption, Dividends, and the Cross-Section of Equity Returns," 2002

European Finance Association:
"Emerging Equity Markets and Economic Development," 2000
"Does Financial Liberalization Spur Growth?" 2001
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"Growth Volatility and Equity Market Liberalization," 2002
"Liquidity and Expected Returns: Lessons from Emerging Markets," 2003
"Interpreting Risk Premia Across Size, Value and Industry Portfolios," 2003
"Global Growth Opportunities and Market Integration," 2004
"The Risk Return Tradeoff in the Long-Run: 1836-2003," 2005
"What Segments Equity Markets?" 2007
"Asset Fire Sales and Purchases and the International Transmission of Financial Shocks" 2010
"Regulatory Pressure and Fire Sales in the Corporate Bond Market" 2010

World Bank Conference on Financial Globalization:
"Does Financial Liberalization Spur Growth?" 2002
"Global Growth Opportunities and Market Integration," 2005

World Bank Conference on Corporate Governance:
"What Segments Equity Markets?" 2007

Darden Emerging Markets Conference:
"Liquidity and Expected Returns: Lessons from Emerging Markets," 2005
"What Segments Equity Markets?" 2008
"Asset Fire Sales and Purchases and the International Transmission of Financial Shocks," 2010
"The European Union, the Euro, and Equity Market Integration," 2011
"Political Risk and International Valuation," 2012

University of Amsterdam Asset Pricing Retreat:
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"What Segments Equity Markets?," 2007

Washington University in St. Louis Asset Pricing Conference:
"What Segments Equity Markets?," 2007

St. Louis Federal Reserve Bank 27th Annual Economic Policy Conference, Finance and Real Economic Activity
"Equity Market Liberalization in Emerging Markets,"

Hotelling Triangle Econometrics Conference:
"Market Efficiency, Fundamental Values, and the Risk Premium in Global Equity Markets," 2001,

Conference on Financial Systems and Crises at the Yale School of Management:
"Does Financial Liberalization Spur Growth?" 2001

National Bureau of Economic Research - Inter-American Seminar of Economics:
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LARC meetings in Monterrey, Mexico
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INVITED RESEARCH PRESENTATIONS:
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INVITED/KEYNOTE CONFERENCE SPEECHES:
CEPR – Asset Pricing Seminar (invited focus session)
"Mis-Pricing and Cash Flow Risks," 2005
Emerging Markets Finance and Economics Meeting, Istanbul, Turkey
"Emerging Markets Liquidity," 2006
Brazilian Finance Conference, Sao Paulo, Brazil
"What Segments Equity Markets?" 2007

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EMBA (evening & weekend & One-MBA) Macroeconomics (core), 2008-present
EMBA (evening & weekend) Global Financial Markets, 2008-present
EMBA (joint with Tsinghua University) Global Financial Management, 2013-present
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INSEAD/ILPSIE (Mumbai, India), 2013

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University of North Carolina:
Investments, 2006

Indiana University:
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Duke University:
Financial Markets and Investments, 1999
Recipient of teaching award for best graduate student teacher

Ph.D.:
University of North Carolina:
Financial Economics, 2006-present

Indiana University:
Empirical Asset Pricing, 2003-2006

Duke University:
Mathematical Economics for Ph.D. students, 1999

SERVICE:
TO THE PROFESSION:

Ad-hoc Referee:
American Economic Review, Journal of Finance, Review of Financial Studies, Journal of Financial Economics, Journal of International Economics, Journal of Financial and Quantitative Analysis, Journal of Econometrics, Review of Economic Studies, Economic Journal, Journal of Empirical Finance, Journal of Financial Markets, Journal of Banking and Finance, Journal of Money, Credit, and Banking, Journal of Financial Intermediation, Journal of International Money and Finance, Journal of Applied Econometrics, Review of Finance, European Economic Review, Southern Economic Journal, Hong Kong - University Grant Committee

Program Co-Organizer:

Duke-UNC Asset Pricing Conference

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Darden Emerging Markets Conference. 2008-present
European Finance Association, 2010-present
Napa Conference, 2011-present
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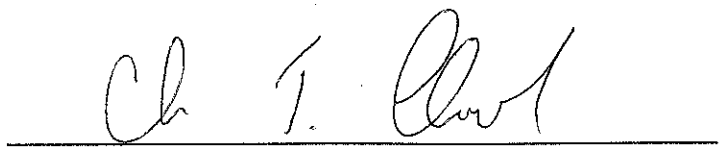
Alpha Challenge, 2009-2010

Ph.D Committee: Casey Dougal (2013), Isacco Piccioni (2012, chair), Matt Ringgenberg (2011), Wipawin Promboon (2009), Peter Groznik (2003), Pankaj Jain (2002), Sam Henkel.

DECLARATION

I declare under penalty of perjury that the foregoing is true and correct.



November 26, 2013

STATEMENT

OF

JON SWALLEN

Jon Swallen
Chief Research Officer

November 15, 2013

Kantar Media Ad Intelligence (KMAI) is the leading provider of advertising intelligence to advertisers, media agencies, and media owners. We syndicate our data for sale and have more than 3,000 clients. Because of our industry knowledge, technical expertise, data collection methods and tracking coverage KMAI is widely regarded as the benchmark source for ad spending estimates. Our statistics are frequently quoted by analysts and journalists in their coverage of the ad business.

KMIA ad tracking technologies continuously monitor over 30,000 media outlets across these media types and sub-types.

Media	**Sub-Type**	**Media**	**Sub-Type**
Television	• Broadcast Net TV	Magazines	• Consumer Magazine
	• Cable Net TV		• Sunday Magazine
	• Hispanic TV		• B-to-B Magazine
	• Syndication TV		• Hispanic Magazines
	• Spot TV		• Local Magazines
Newspapers	• Local Newspapers	Online	• Internet Display
	• National Newspapers		
	• Hispanic Newspapers		
Radio	• Network Radio	Outdoor	• Billboards & Posters
	• Local Market Radio		• Transit
	• National Spot Radio		

We observe and collect more than 1 billion advertising occurrences per year. These empirical data lead to “bottom up” tabulations of the US ad market. We only report on ads we have actually collected. This approach sets us apart from companies that use macro-economic modeling to develop ‘top down’ projections of the US ad market which are not rooted in empirical observation of advertising activity.

KMAI receives monthly ad pricing information from media sellers and media buyers. We develop an average, fair-market unit price per media vehicle which is then applied to all of the monitored advertising in the media vehicle. (A “media vehicle” is a single TV program, a single website, a single magazine title, etc.) In this manner a spending value is assigned to each and every ad occurrence. From these occurrence-level records our data can be rolled up to a tabulation of Total US advertising expenditures. Our database goes back to 1995, enabling trend analysis.

The table below presents KMAI calculations of total ad spending from 2007 through 2012.

	Advertising Expenditures (in millions)					
MEDIA	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Network TV	$23,754.6	$23,658.8	$21,855.5	$22,936.9	$22,452.0	$24,141.4
Spot TV	$17,547.1	$18,317.2	$14,185.7	$17,458.1	$16,605.8	$18,240.8
Hispanic TV	$3,483.5	$3,629.1	$3,485.8	$3,698.0	$4,060.5	$4,555.3
Cable TV	$19,108.0	$19,732.9	$19,478.8	$21,412.4	$23,679.8	$24,717.3
Syndication	$4,173.1	$4,444.9	$4,229.1	$4,111.1	$4,746.1	$5,132.5
Consumer Magazines	$25,652.4	$23,741.0	$19,476.7	$20,078.3	$20,069.6	$19,518.5
Sunday Magazines	$1,999.8	$1,904.0	$1,694.8	$1,772.3	$1,644.5	$1,599.0
Local Magazines	$473.0	$402.9	$331.9	$335.2	$327.8	$335.1
Hispanic Magazines	$111.8	$104.0	$64.2	$67.3	$80.4	$85.9
B-to-B Magazines	$4,191.1	$3,964.6	$2,879.8	$2,748.7	$2,755.9	$2,641.3
National Newspapers	$3,346.5	$2,961.8	$2,435.1	$2,501.0	$2,410.7	$2,137.9
Local Newspapers	$22,776.5	$20,104.5	$16,036.6	$15,289.2	$14,959.1	$14,573.1
Hispanic Newspapers	$363.6	$317.6	$256.2	$259.8	$263.6	$270.7
Network Radio	$1,002.2	$974.9	$889.7	$909.0	$933.1	$1,083.4
National Spot Radio	$2,502.8	$2,223.1	$1,675.9	$1,987.7	$1,879.4	$1,939.7
Local Radio	$7,189.4	$6,320.7	$5,006.2	$5,253.4	$5,322.2	$5,705.6
Internet Display	$9,249.6	$9,651.0	$9,899.9	$10,169.1	$12,498.2	$12,348.0
Outdoor	$4,032.6	$3,964.0	$3,439.3	$3,770.1	$4,015.2	$4,221.3
GRAND TOTAL	**$150,957.5**	**$146,417.3**	**$127,321.0**	**$134,757.7**	**$138,703.8**	**$143,246.8**

The aggregate percent change from 2007 to 2012 is a decline of 5.1 percent. This is likely an overstatement of how much total ad spending has actually declined. The reason is KMAI's limited tracking and reporting on online advertising.

KMAI measurement of online advertising is limited to Internet display ad formats. Other forms of online advertising – paid search, video, mobile, social – are not included. External estimates of online ad spending from the Internet Advertising Bureau, which are based on self-reported revenue from media owners, indicate paid search, video, mobile and social are an increasing proportion of total online ad spend and are growing at a faster rate than display. If the other online ad types were included in KMAI reporting, the 2012 vs. 2007 comparison would shift in favor of 2012.

KMAI is not the only company that reports a figure for Total US ad spending. The following graphic demonstrates the number and diversity of published estimates in the public domain.

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Comparative Estimates: US Total Media Ad Spending, 2012-2017
billions

	2012	2013	2014	2015	2016	2017
Winterberry Group, Feb 2013	$259.5	$267.6	-	-	-	-
Jefferies, Sep 2012	$195.8	$202.2	$209.3	$216.8	-	-
Citi Research, June 2012	$178.2	$185.4	-	-	-	-
RBC Capital Markets, April 2013	$178.6	$184.0	$189.5	-	-	-
Barclays Capital, March 2013	$179.2	$182.7	-	-	-	-
JMP Securities, March 2013	$180.4	$181.3	$184.9	$187.7	$190.5	$193.4
Cantor Fitzgerald, Sep 2012	$177.0	$177.1	$183.6	$186.1	$195.1	$198.2
Deutsche Bank, April 2013	$176.3	$176.4	$182.2	$183.1	-	-
Pivotal Research Group, May 2013	$177.1	$176.2	$184.6	$186.7	$196.7	$199.3
J.P. Morgan, Jan 2013	$176.9	$176.2	$182.8	$184.5	$194.4	-
eMarketer, Aug 2013	**$165.0**	**$171.0**	**$177.8**	**$183.4**	**$190.9**	**$197.0**
ZenithOptimedia, June 2013	$161.2	$166.9	$174.4	$182.4	-	-
GroupM, Aug 2013	$153.5	$156.3	$160.8	-	-	-
MAGNA GLOBAL, June 2013	-	$155.0	$164.1	-	-	-
Strategy Analytics, June 2013	$128.0	-	-	-	-	-
VSS, Sep 2012	$200.8	-	-	-	$255.2	-
Kantar Media, March 2013	$140.0	-	-	-	-	-

Source: eMarketer, Aug 2013; various, as noted, 2012 & 2013

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The range in estimates reflects differences in projection techniques and the media included in the figures. For example, direct mail is included by Winterberry Group, Jeffries and Pivotal Research Group but excluded by all the other companies on the above list. Another example: estimates from Pivotal Research Group exclude the fees and commission paid by advertisers to media buyers while KMAI and most other companies include these amounts.

In closing, Kantar Media Ad Intelligence data are widely accepted, known and used to describe trends in US ad spending. Our figures are built up from empirical observation of advertising occurrences in a defined and broad universe of offline and online media outlets and these data extend back to 1995. As Chief Research Officer, I'm available to answer any questions about our data, measurement methods, etc.

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